FOOD ENGINEERING

NOVEMBER, 1956

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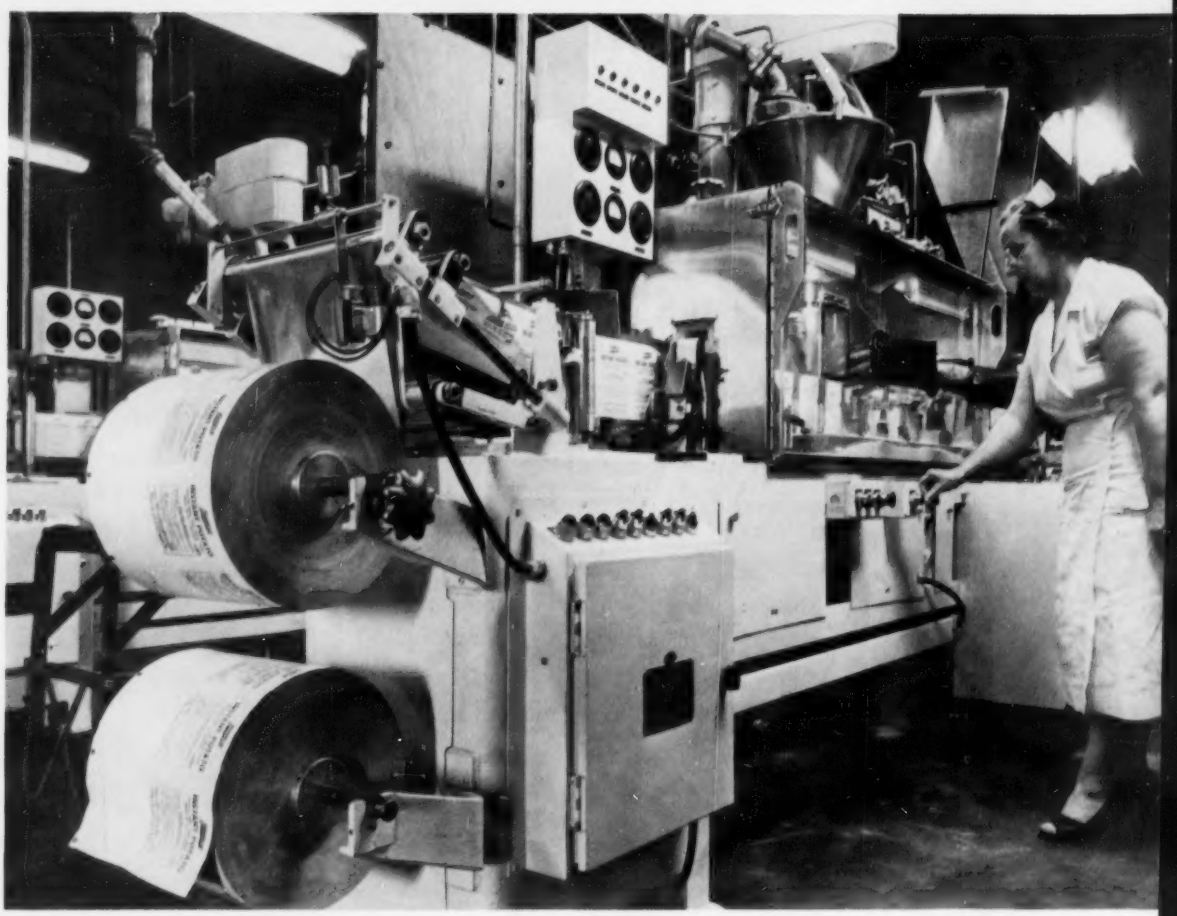

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ALSO: PRODUCTS • PROCESSING • QUALITY CONTROL • PERSONNEL • MATERIALS HANDLING MAINTENANCE • INSTRUMENTS • TRANSPORTATION • INGREDIENTS • SANITATION • ENGINEERING

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NOVEMBER 1956

Volume 28 Number 11

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CUT OUT AND FILE

PRACTICAL IDEAS

New SO_2 Treating Method

Most ways of sulfur-dioxiding pre-peeled potatoes and apples consist in immersion of the raw material in an SO_2 solution, or solutions of unstable salts or acids which produce SO_2 upon breaking down.

The methods that use dips face an inherent difficulty, since the solutions must be tested frequently and adjusted to maintain proper concentration for protection of color without adverse effect to the flavor.

Another difficulty: Raw material varies in its ability to absorb SO_2, so it's difficult to control product content.

To circumvent these problems, inject 100 to 150 ppm. of SO_2 gas into a polyethylene bag containing the potatoes or apples (which can then be stored in these bags at a temperature between 32 and 40F. for a period of about 10 days).

One advantage of this method, in contrast to the dip way, is that there is no loss of SO_2 into the atmosphere to annoy workers.

To measure the gas added, pass the SO_2 into an expansion chamber (see photo of laboratory model), through an automatic pressure regulator (gas sample cylinder obtainable from Macalaster Bicknell Co., Cambridge, Mass.; pressure regulator from The Matheson Co., Inc., East Rutherford, N. J.)

The valve between the supply and the expansion chamber is then closed. And the gas trapped in the expansion chamber is allowed to expand into the bag of products. Amount of gas released is controlled by volume of the expansion chamber and pressure of the SO_2 in the supply tank. Chamber capacity should be about 100 ml. for every 10 lb. of material treated.

To calibrate, measure volume of expansion chamber (in milliliters of water) and substitute that value, along with the gage pressure (in psi.) and temperature (in degrees Centigrade), in the following formula:

$$\text{Mg. of } SO_2 \text{ delivered} = \frac{53.13}{273 + \text{temp.}} \times \text{Vol.} \times \text{Pressure}$$

Of course, passing the gas into an excess of standard NaOH and then back, titrating with standard acid, using phenolphthalein indicator (1 ml. 0.1 N NaOH= 0.0032g. SO_2), provides a more accurate method of titrating.

If an analytical balance is available, a third method of calibration may be employed. Fill the chamber at various gage pressures, then disconnect the expansion chamber and weigh it. Weight of SO_2 delivered at any gage pressure is then just the difference in weight between the chamber filled at that gage pressure and the chamber filled at atmospheric pressure.

Laboratory setup for experimental gas treatment may be modified for commercial use by employing larger tanks connected to a supply manifold and using rapid acting valves in place of the needle valves illustrated.—*W. Averill, Assistant Chemist, Agricultural Experiment Station, University of New Hampshire, Durham, N. H. (Published with permission of Director as Scientific Contribution No. 192 of New Hampshire Agricultural Experiment Station.)*

To End Breaks in Concrete

Cracks in concrete, caused by shrinkage or structural conditions, can be controlled by increasing the ratio of reinforcing steel to concrete.

According to recent tests by the Bureau of Standards, this is accomplished by giving preference to the use of a larger number of small bars.—*Technical Bulletin, General Foods Corp.*

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(Formerly Food Industries)

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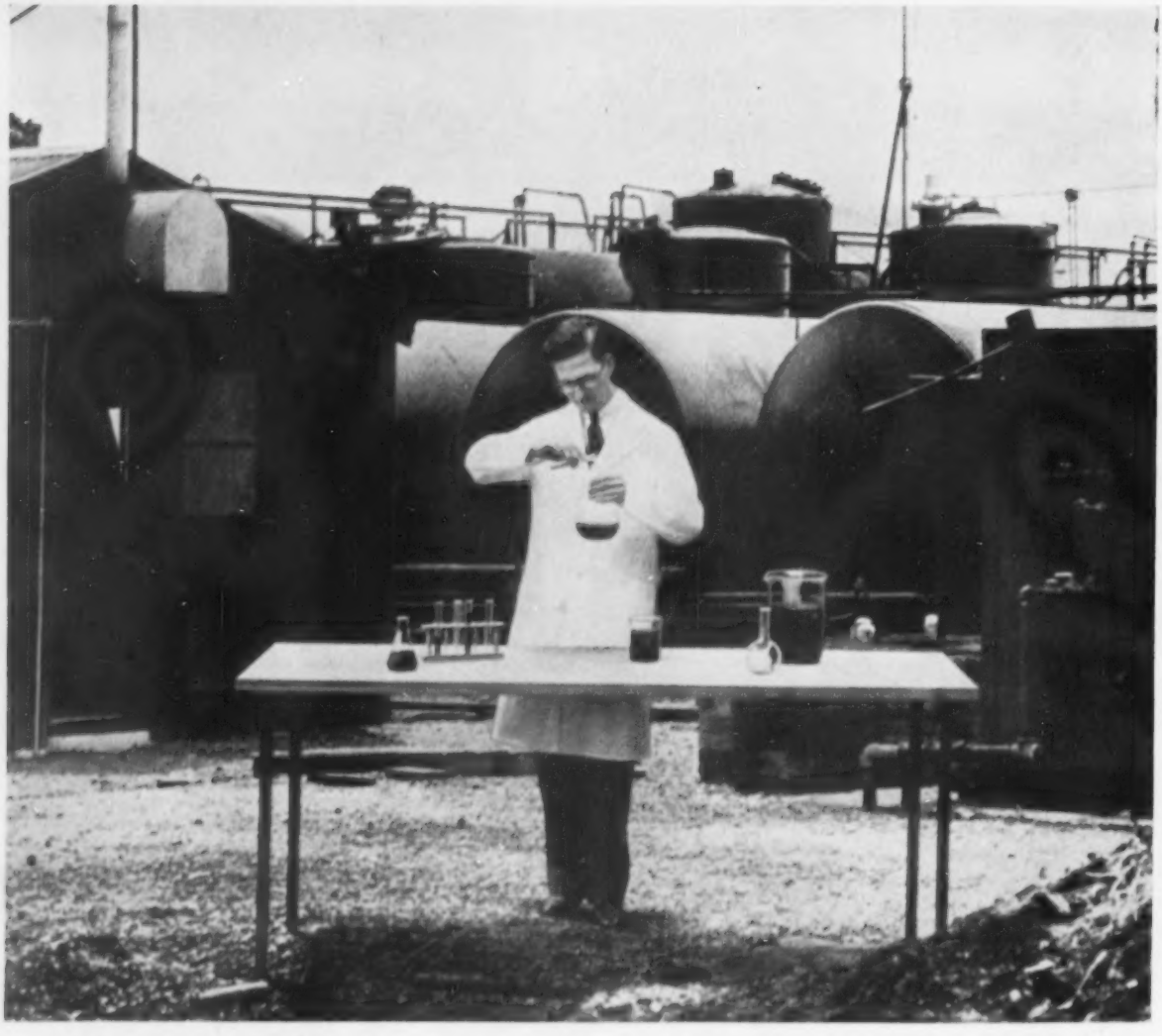

What's a chemist got to do with tank cars?

Liquid level—vapor action—types of linings—temperature factors—the presence of impurities . . . these are a few of the considerations which the chemist must evaluate. It's the chemist's job to see that bulk liquids are shipped in the cars equipped to carry his products. The knowledge gained from years of hauling liquids in bulk enables General American to meet the chemist's exacting requirements—to assure that corrosion of the cars will be minimized and product contamination prevented.

This skill and experience is part of every GATX lease . . . a lease that provides shippers with the most dependable service available for bulk liquid transportation. When you lease cars from General American, you avoid the need for capital investment as well as operating, servicing and maintenance problems.

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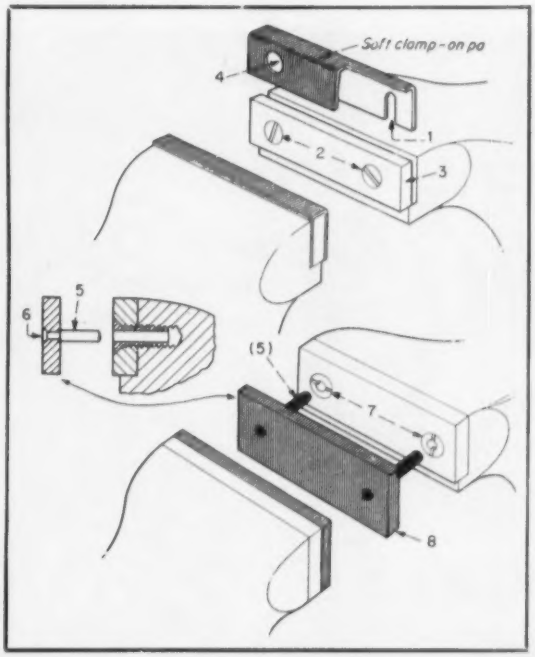


Removable Soft Vise-Jaw Cover

When a vise is used for work on delicate materials that require soft covers over the jaws of the unit, two procedures are recommended.

Pieces of plain 16-gage mild steel sheet form good, strong clamps for general fitting work. Therefore, it is not unusual for mechanics to keep such clamps permanently in place on the vise jaws.

One method of securing them to vises having detachable jaws is easily executed. The clamped-on piece is bent over a channel section with a pair of elongated slots—(1) in sketch—spaced the same distance apart as the screws holding the hardened pad to the vise.

The screws (2) holding the hard pad (3) are eased and backed to leave a small space between the pad and the vise body. The slotted leg of the soft clamp can then be inserted into this space. And screws, reached through holes (4) in the other face, are retightened to hold the pad firmly in place.

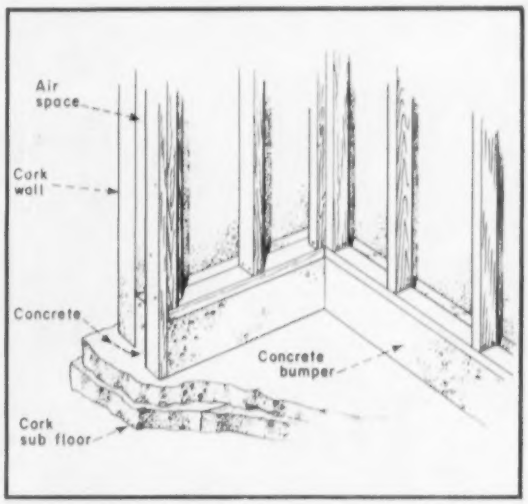
Holes (4) can be omitted in order to have an unbroken holding surface. Instead of pre-forming the clamp in a channel shape, the material is left in the flap and the two notches (1) are cut in one edge. The clamp is locked in place by the two screws as formerly, and is then hammered over the hardened jaws to form a channel section. When it is desired to remove the soft clamp made in this way, the front leg can be pried up to gain access to the screw heads.

When pads are made from mild steel, the clamps have a wide range of application and can stay in place for gripping everything but the roughest work.

Another quick detachable pair of soft clamps of more elaborate construction is made of pieces of soft metal of ¼ in. or more in thickness. Each unit is fitted with a pair of plain pins (5), which have a step turned on them to fit in holes drilled in the packing pieces. The ends (6) of the reduced diameter are riveted over.

The screws (7) holding the hardened pad to the vise body are removed, and after drilling axially in a lathe throughout their length are replaced to hold the hardened jaw.

The soft clamp (8) can then be fitted by sliding the two pins into the drilled holes. To maintain pads in position, bend the pins slightly so that they have a frictional hold in the holes in the groove.—*Clifford T. Bower, Tool Engineer, London, England.*



Guards Insulation From Trucks

During the past ten years our company has developed methods of protecting cork insulation in our refrigerated rooms from damage by fork-trucks.

Our newest freezer storage building, which has a 23 ft. high ceiling, was insulated with 6 in. of cork board on the inside of the walls. And had plans not been made to protect this insulation much of it would have been exposed to the abrasion of fork-lift masts and pallets.

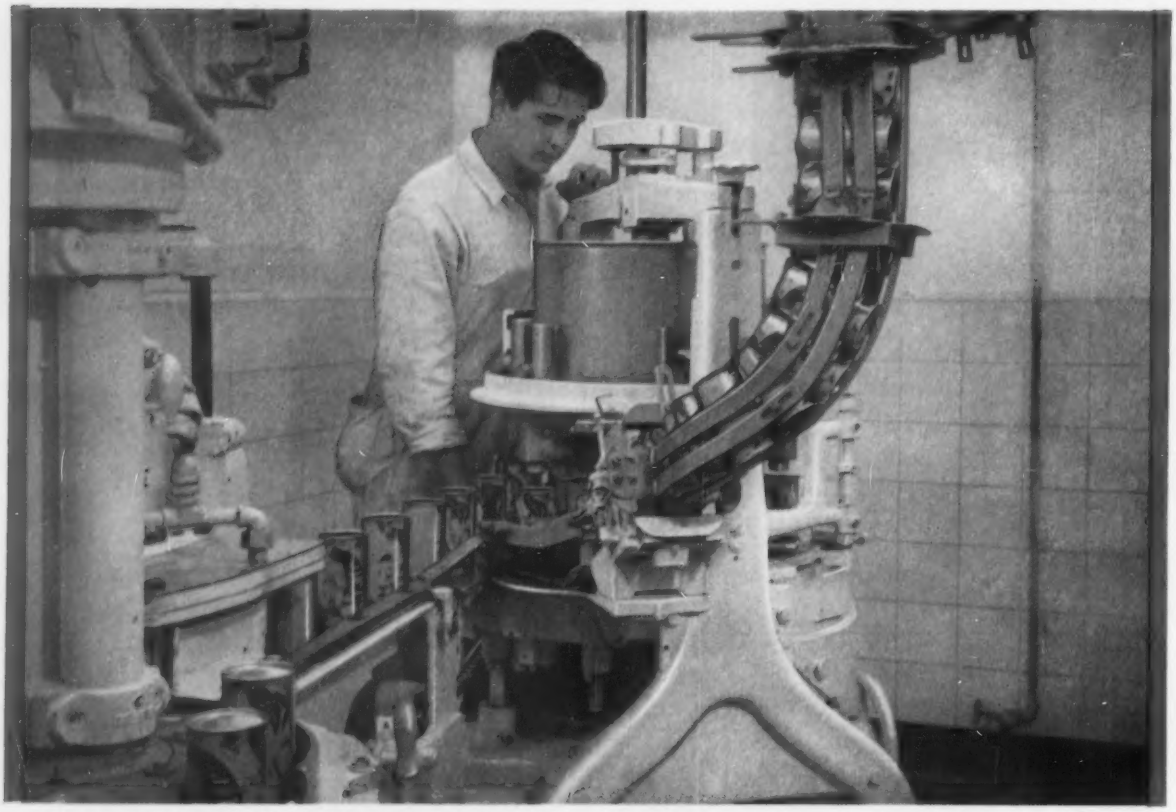
We have several protective features. An 8-in.-thick by 12 in. concrete bumper (sketch) was constructed around the perimeter of the building at the same time the wearing floor was poured. Its functions are to keep the fork-lifts away from the cork and to act as a foundation for a skeleton 2x4 stud wall to guard the cork at higher levels. The cork board itself is not painted or finished in any way.

The vertical 2x4's have been put in so that they come flush with the door casing. The edge of the 2x4 stud, the cork, and the area up to where the door casing begins is covered with galvanized metal to further protect the cork around the perimeter of the doorway.

The stud wall has added value. It insures 6 in. of air space between the nearest stored packages and the wall—even when a pallet of product leans over against the 2x4's.

This method has proved itself, the building having

"Our FMC M&S Filler has performed excellently in all respects" ..... Says C. W. REYNOLDS, Manager Products Division, Ventura Coastal Lemon Company



"...We use this 6 pocket M&S Filler almost entirely on 211 x 414 cans, operating at a speed of 216 cpm on citrus juice concentrates. On occasion we have also used it for filling 202 x 214, 202 x 314, 307 x 409, and 404 x 414 cans. In 3½ years we have averaged over a quarter of a million cans a day, two 20-hour days a week, 6 to 8 months a year. Repairs have been minor."

These fillers give you a higher case yield per batch of product

FMC—M&S Plunger or Piston Fillers are built in 6, 9, 10, 15, 20 and 30 pocket sizes. They are designed on the time-proven principle of product pre-measurement and positive ejection into containers by precision pistons. Ideally adaptable to a wide range of liquid, semi-liquid and heavy semi-solid products.

Send for free copy of Bulletin No. 501E, "Fillers by FMC."

FMC offers fillers of highest speed and accuracy for every food filling job—from liquids to semi-solids. By actual comparison testing, M & S positive displacement type fillers give you the four things that you want most in a filler—

1. *High Accuracy.* Exclusive pre-measuring principle of M&S insures consistant filling accuracy for higher case yield per batch of product.

2. *Low Maintenance.* Rugged construction and precision engineering of M&S assures long life and dependability under the heaviest production requirements.

3. *High Speed Operation.* The M&S line includes fillers in every speed range—equalling the speed of latest cappers and closing machines—without sacrifice of accuracy.

4. *Sanitary by Design.* Available in stainless and non-corrosive type contact materials to meet specific needs. Easily dismantled for cleaning.

This is why M&S has been recognized as the "Standard of the filling industry" for more than 70 years. Your FMC representative will gladly recommend an M&S Filler for *your product*. Won't you call him today?

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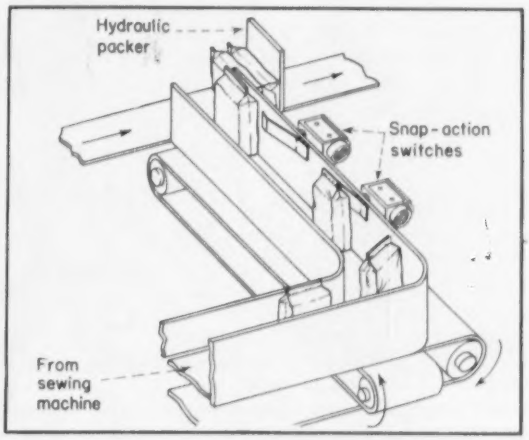
been in operation two years without insulation damage. True, the 2x4's have been damaged in a few instances, but they have done their job in protecting the insulation, and insuring adequate air circulation near the walls.—*P. J. Morrissey, Security Warehouse & cold Storage Co., San Jose, Calif.*



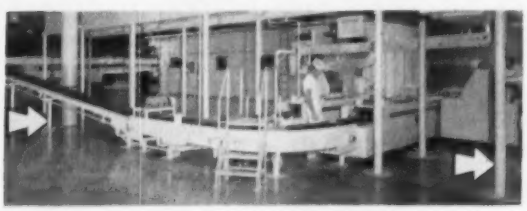
Ends Conveyor Damage

When bags of sugar pile up on the conveyor in our bag-closing department, they often become torn, and thus frequently injure the sewing machines.

Cure was to install two snap-action Microswitches on the conveyor.

The two switches (sketch) were wired in series with the control circuit. Each switch operates independently as a bag passes, so that the complete circuit is not closed until the packer jams.

When both switches are actuated, the control circuit is opened and the conveyor stops.—*R. D. Golls, Crookston, Minn.*

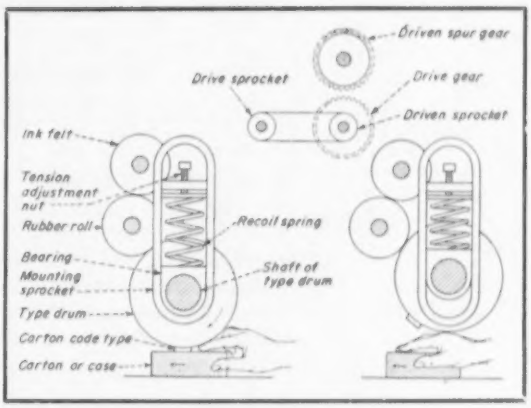


Speeds Cleaning, Ups Sanitation

Bakery sanitation begins with the design of the plant and its equipment.

In instances where it was necessary to elevate equipment from the floor, units were designed to be supported by single-pipe "columns" (see photo).

This eliminates the use of angle-iron supports—so difficult to keep clean—and substitutes round surfaces, which are easily swept and mopped around.—*Langendorf United Bakeries, Inc., Bell Gardens, Calif.*



Ends Coder Accident Hazard

Two serious accidents at our plant were traceable directly to the positive drive on our coders. When a hand slipped under the code-drum there was no give—and hence an injury.

We improved our coder drive to eliminate this hazard and at the same time increase code-printing efficiently, especially on irregular cartons, such as used for frozen corn on the cob.

We mounted the shaft of the drum (sketch) in a housing or bracket that permitted the insertion of a spring impinging on the bearing and a tension adjustment device.

The code drum is positioned to carton height. Should a larger material now enter the space between the drum and the base, the drum will lift against the spring tension, disengaging the gear teeth driving it and thus ending its operation until again lowered into operating position.—*Leonard W. Moore, Pictsweet Foods, Inc., Albany, Ore.*

New Color Standards

Many food processors now depend on a new type of yardstick for measuring quality of fresh fruits and vegetables. These devices are color standards made from styrene plastic.

They're used to color-grade produce prior to processing in canning, freezing, and preserving plants. Among colors already matched in styrene, and accepted as standard, are tomato red, peach yellow, and lima bean green.

In addition to serving as the basis of visual judgment, these new standards are also employed for calibrating sensitive instruments that do the grading automatically. In California, both methods were employed last year in spotchecking the quality of approximately $45 million worth of canning tomatoes.

Color standards have been utilized for years in judging ripeness and quality of fresh produce. However, this use of molded styrene standards is relatively new. The plastic makes precise, durable color standards that are easily mass produced.—*George W. Ingle, Monsanto Chemical Co.*

Three food plant lube problems STANOIL Industrial Oil can help you whip

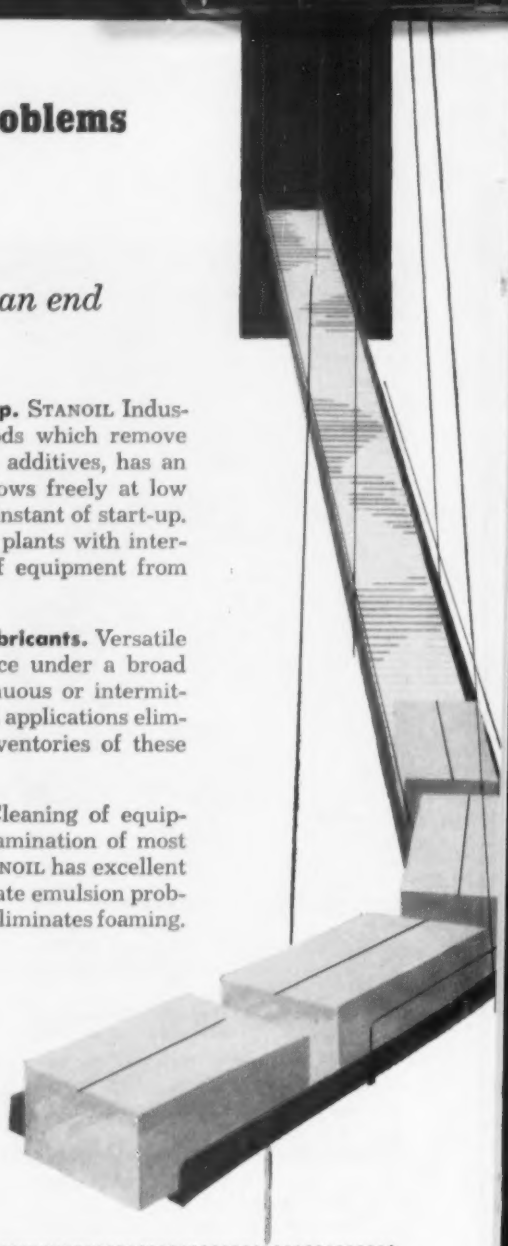
big maintenance headaches can end with switch to STANOIL

1. Poor flow of lubricant on cold start-up. STANOIL Industrial Oil, due to selective refining methods which remove waxy constituents and the use of special additives, has an exceptionally low pour point. STANOIL flows freely at low temperatures, is ready to lubricate at the instant of start-up. Candy, bakery and other food processing plants with intermittent production get full lubrication of equipment from start to stop.

2. Large inventory of special purpose lubricants. Versatile STANOIL gives top lubrication performance under a broad range of conditions...heat or cold, continuous or intermittent, high pressures and low. One oil for all applications eliminates special purpose oils, eliminates inventories of these oils, eliminates application mistakes.

3. Water contamination of lubricant. Cleaning of equipment and condensation mean water contamination of most oils with resulting water-oil emulsion. STANOIL has excellent demulsibility, is specially refined to eliminate emulsion problems, contains an additive which virtually eliminates foaming.

Check with your Standard Oil industrial lubrication specialist about converting your plant to STANOIL. There is one of these Standard men near you in any of the 15 Midwest and Rocky Mountain states. Call him or write Standard Oil Company, 910 S. Michigan Ave., Chicago 80, Illinois.



Quick Facts About STANOIL Industrial Oil

- **Stability.** STANOIL's antioxidant gives oil resistance to chemical change, minimizes deposits.
- **Rust Prevention.** Inhibitor in STANOIL "plates out" on metal surfaces, prevents corrosion.
- **Cold Starts.** STANOIL has low pour point. Flows freely from cold start. No need for costly warm ups.
- **Resists Effects of Temperature Change.** STANOIL has high viscosity index, is resistant to change in both high and low temperature service.
- **Excellent Demulsibility.** STANOIL is refined to eliminate emulsion problems, contains additive to minimize foaming.

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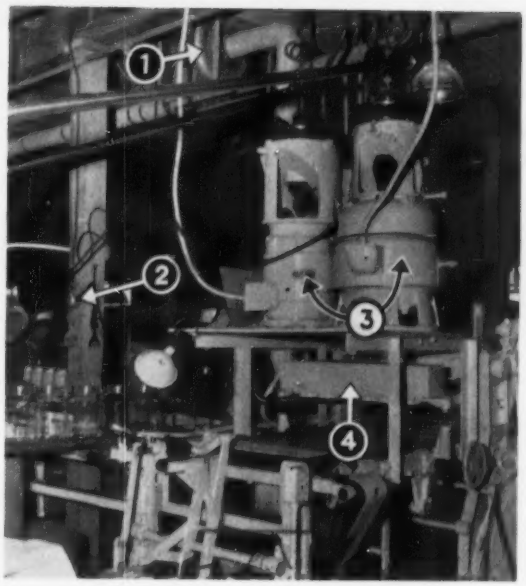


Better Vac-Cleaning of Jars

The machine we employ for filling glass jars with salad dressing came equipped with an arrangement for vacuum cleaning the glass containers before they reach the filling station.

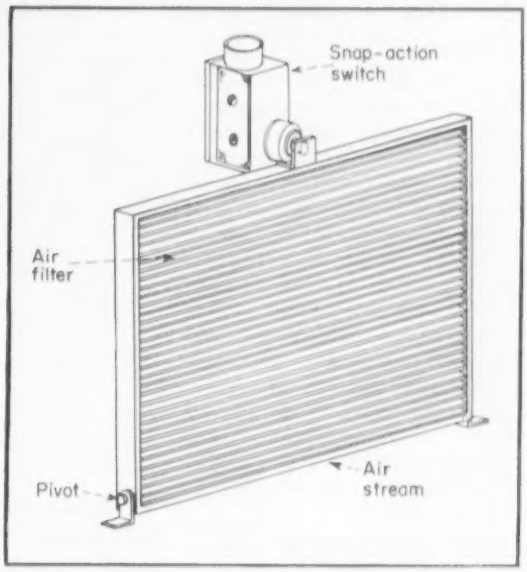
As jars travel toward the spouts in intermittent steps, a gasketed head is periodically lowered over each row of six containers. Air is blasted into the jars to stir and loosen any dust particles. Exhaust is into a head manifold, to be discharged by vacuum into the bag of the vacuum cleaner.

So long as the circumstances were ideal, this cleaning system was effective. However, efficiency dropped as the bag filled. Also, workers frequently failed to empty the filled bag, through oversight or unwillingness to stop production. Further, dust was sometimes spilled and blown about the plant as bags were removed for cleaning.

We eliminated all these difficulties by installing a powerful blower—(1) in photo—which discharges dust removed from the containers into the atmosphere over the plant roof. This blower is wired to the start-stop control (2) of the filler motor, and the motor on the colloid mills (3).

To derive maximum value from the increased suction capacity of the blower, it was found advisable to remove restrictions to air flow by enlarging the head space in the chamber over the jars. This was accomplished by replacing the old head with a welded box type manifold (4) with approximately four times the head space.

Today, our jar cleaning, which can no longer be interrupted so long as the filler is in operation, is both more thorough and more sanitary.—*C. D. Fulton, Plant Engineer, Old Dutch Foods, Inc., Blasdell, N. Y.*



Detects Clogged Air Filters

Air filters in food plants are often located in remote areas where frequent inspection is inconvenient or even difficult. As a result, these filters often become dust-clogged, cutting down the unit's efficiency.

Here is an effective remedy—an automatic warning when an air filter is so filled with dirt that it needs cleaning or replacement:

Mount the filter in a vertical position on a pivot so that a plate extended up above the top of the filter rests lightly against a Microswitch (sketch) positioned

CAN YOU USE $50?

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Also $5 to $15 is paid for each contributed item used. So a few minutes time may net you as high as $65.

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We'll do the finished writing and drawing for you. Send it today, before you forget. Address it to Practical Ideas Editor, FOOD ENGINEERING, 330 W. 42nd St., New York 36, N. Y.—The Editors.

SEPTEMBER PRACTICAL IDEA WINNER was "Tells R. H. for Avoiding 'Sweating,'" sent in by D. S. Davis, Professor of Engineering, University of Alabama, Mobile.

Using Salt Efficiently

by **INTERNATIONAL SALT COMPANY, INC.**—America's largest producer of salt

Three Methods of Measuring Salt—and Their Effects on Brine Uniformity

One of the most important factors in maintaining brine strength at consistently uniform levels is salt measurement. When measurement is inaccurate, brine may be weakened excessively or become too strong. But, when salt is measured accurately, variations in brine strength are virtually eliminated . . . brine production costs are reduced . . . and product quality remains high.

Today, there are three methods commonly used to measure salt in industry. While all of these have certain merits, only one method is completely accurate—measuring salt quantity in the form of saturated brine. A look at the other two methods will show why they are not entirely reliable.

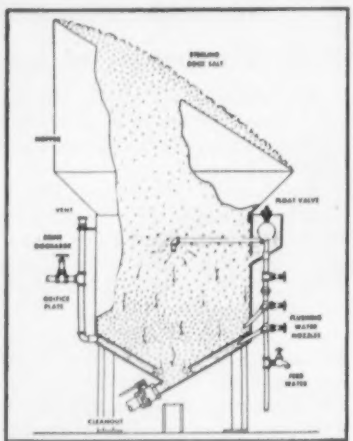
Measurement by dry salt volume. This method presents a number of difficulties. First, moisture content of salt can greatly affect its volume. And humidity changes alter this moisture content to a considerable degree. Degree of compaction makes a big difference in volume, too. A pailful of salt may vary from 25 to 35 lb. (a 40% margin of error) depending on storage conditions, or length of storage. Both moisture content and compaction will change, not only from one day to the next—but also from one batch of salt to another.

Measuring by dry salt weight. This method is somewhat more reliable, but is still far from accurate. When the scale reads 100 lb., it can never be estimated how much of that weight is moisture—one pound or ten. And again, the moisture content of salt varies constantly with air humidity, and humidity of storage areas. When salt is measured this way, control over brine strength is never exact.

Measurement by the saturated brine method. This is effective in every industrial application. It depends, of course, on fully saturated, crystal-clear brine, free from any undissolved solids. One gallon of such brine always contains 2.65 lb. of salt (if dissolution water temperature is within the range found in most plants). By starting with this accurate fixed unit of salt measurement, brine strength can be completely controlled. Whatever strength is desired—the dilution of fully saturated brine with a certain amount of water produces it quickly and accurately.

One of the best ways to get the fully saturated brine essential to this measuring method is with a Lixate Rock Salt dissolver. This device—originated by International—automatically produces clear, fully saturated brine from Sterling Rock Salt. In fact, development of the Lixator made possible accurate salt measurement.

Regulating brine strength with the Lixator: Water is run into storage tank up to a specified mark. Lixate Brine is then added to bring the volume up to another mark. The mixture of water and Lixate Brine will give the exact strength of dilute brine needed—as well as the correct volume.



The Sterling Lixator reduces salt-handling, brine-making and brine-distributing costs. Savings between 10% and 20% on salt used are possible, too.

This method of salt measurement and brine control, of course, does more than protect product quality. It also provides substantial savings in time and labor—since the entire Sterling Lixator operation is fully automatic.

TECHNICAL SERVICE WITH YOUR SALT

Through skilled and experienced "Salt Specialists," International can help you get greater efficiency and economy from the salt you use. International produces both Sterling Evaporated and Sterling Rock Salt in all grades. We also make automatic dissolvers in metal or plastic for both types of salt. So we can suggest the type and grade of salt most perfectly suited to your needs.

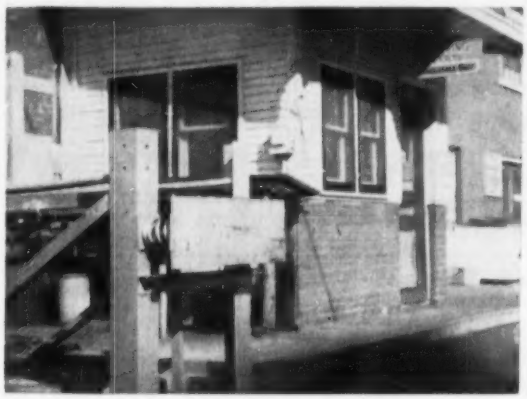
If you'd like help on any problem concerning salt or brine—or further information on salt measurement—contact your nearest International sales office.

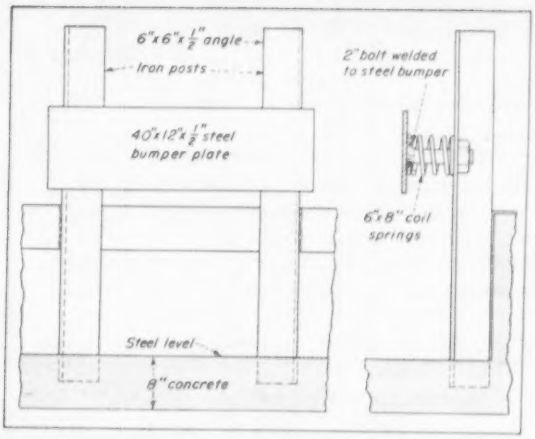
International Salt Co., Scranton, Pa.
Sales offices: Atlanta, Chicago, New Orleans, Baltimore, Boston, Detroit, St. Louis, Newark, Buffalo, New York, Cincinnati, Cleveland, Philadelphia, Pittsburgh, Richmond.

FOR INDUSTRY, FARM, AND THE HOME—
STERLING SALT
PRODUCT OF INTERNATIONAL SALT CO., INC.

to face in the direction of the flow of incoming air.

Accumulating dirt builds up resistance, exerting pressure on the snap-action switch. This closes the circuit to a warning light and/or alarm bell or horn.—*Microswitch Div., Minneapolis-Honeywell Regulator Co., Freeport, Ill.*





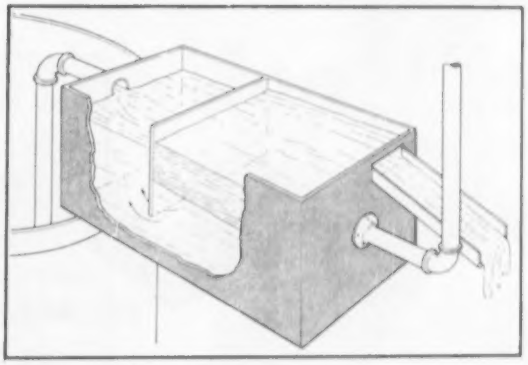
Spring-Loaded Truck Bumpers

Too often we found that trucks damaged our building or equipment when they backed up to conveyors and platforms for loading or unloading. The shocks from these impacts also eventually disintegrated the bumpers.

We overcame this hazard by placing heavy coil springs into spring keepers mounted on 2-in. bolts. The bolts are welded to ½ x 12 x 40 in. bumpers made of steel plate (see photo).

Springs and spring keepers on these 2-in. bolts are placed between the bumper plate and the safety angle-iron supporting posts. The assembly is held in place by nuts on the end of the threaded bolts, which project through holes in the two angle-iron posts (sketch).

The two units that have been in service for three years at our plant have given no trouble and have required no repairs.—*Virgil Keith, Engineer, Midwest Dairies, Centralia, Ill.*



Trap Improves Filtering

At the Davenport, Iowa, plant of Oscar Mayer Co., brine injection needles on the automatic pickling machine are spaced to inject the entire surface of the largest bellies processed.

But since most of those processed here are smaller, and since pickling brine squirts from each needle during injection, a portion of fluid usually doesn't enter the product.

To prevent costly waste, this excess is collected in a tank under the machine. A rise above the proper level trips the float valve controlling the pumping of brine back to the supply tank.

Since many pieces of fat tended to accumulate in the tank below the machine, sock filters were employed to separate the fat and prevent its return to the brine supply tank. However, these socks quickly plugged up, and so they were abandoned.

But since removal of fat particles was necessary to prevent clogging of the injection needles, a Sparkler filter was installed, also a tank for make-up and the addition of filter-aid. Dycalite No. 4200 has been employed effectively as the filter-aid.

Then it was found necessary to trap out the fat particles to thus cut down the load on the filter and also the amount of filter-aid required.

The discharge of particle-free brine from the fat removal trap (sketch) is directly into the filter make-up tank.

Here is the procedure:

When the holding tank is half full of recovered pickle, it is filled with new pickle. Filter-aid is then added, and the pickle is filtered into the injector reservoir tank.

Amount of filter-aid is figured by amount of recovered pickle in the tank. None needs to be figured for the new pickle added.

With proper baffling of the fat separator, 1 lb. of filter-aid per 100 gal. of brine is sufficient. With no baffle separator to remove the fat particles, considerably more filter-aid would be required.

Quality control personnel report that the filtered pickle has a bacteria count of less than 25% of the unfiltered pickle. Also, the company estimates a recovery of between 600 and 800 gal. of brine per day, which at a cost of approximately 12¢ per gal. represents a notable saving.—*FE Staff.*

Jenni Genetron Says—

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	genetron 12	genetron 141	genetron 226	genetron 320	genetron 11
Frozen Food Plants	✓	✓	✓	✓	✓
Freezer Locker Plants	✓		✓	✓	✓
Frozen Food Display Cases	✓	✓			
Commercial Ice Cream Freezers	✓	✓	✓	✓	✓
Ice Cream Hardening Rooms	✓	✓	✓	✓	✓
Store Ice Cream Display Cases	✓	✓			
Packaged Frozen Custard Freezers	✓	✓			
Store Refrigerators	✓	✓			
Store Walk-in Refrigerated Rooms	✓	✓			
Store Delicatessen Display Cases	✓	✓			
Soda Fountain Ice Cream Boxes	✓	✓			
Soda Fountain Beverage Coolers	✓	✓			
Milk Plants	✓	✓	✓	✓	✓
Butter and Lard Chillers	✓	✓	✓	✓	✓
Bottled Beverage Coolers	✓	✓			
Refrigerated Candy Display Cases	✓	✓			
Home Freezers	✓	✓			

GC
Allied Chemical

GENETRON QUALITY SPECIFICATIONS

genetron 12 WHITE LABEL
DICHLORODIFLUOROMETHANE

Quality Specifications

Moisture wt. %, max.	0.0010
Chlorides	none
High boiling impurities—vol. %, max.	0.01
Noncondensable gases (gases insoluble in perchloroethylene)—vol. % in vapor phase, max.	1.5
Boiling pt. at 760 mm. Hg °F max.	−21.6
Boiling range °F (to 85% pt.), max.	0.5

genetron 141 GREEN LABEL
MONOCHLORODIFLUOROMETHANE

Quality Specifications

Moisture wt. %, max.	0.0010
Chlorides	none
High boiling impurities—vol. %, max.	0.01
Noncondensable gases (gases insoluble in perchloroethylene)—vol. % in vapor phase, max.	1.5
Boiling pt. at 760 mm. Hg °F	−41.4
Boiling range °F (to 85% pt.), max.	0.5

genetron 226 PURPLE LABEL
TRICHLOROTRIFLUOROETHANE

Quality Specifications

Moisture wt. %, max.	0.0025
Chlorides	none
Boiling pt. at 760 mm. Hg °F	117.6
Boiling range °F (to 85% pt.), max.	1.8

SUPER-DRY Refrigerant for Every Frozen Food Use!

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ALLIED CHEMICAL & DYE CORPORATION

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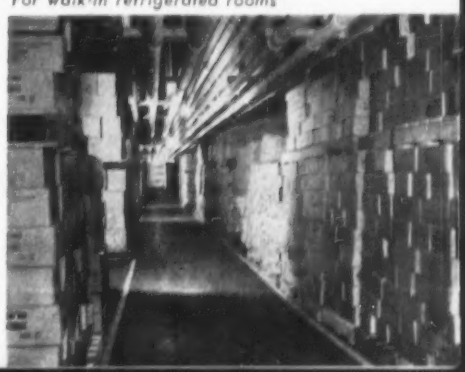
For frozen food plants, freezer locker plants, milk plants

For refrigerated display cases

For soda fountain ice cream boxes, beverage coolers, packaged freezers

For walk-in refrigerated rooms



genetron 320 DARK BLUE LABEL

DICHLOROTETRAFLUOROETHANE

Quality Specifications

Moisture wt. %, max.	0.0010
Chlorides	none
High boiling impurities—vol. %, max.	0.01
Noncondensable gases (gases insoluble in perchloroethylene)—vol. % in vapor phase, max.	1.5
Boiling pt. at 760 mm. Hg °F.	37.6
Boiling range °F (to 85% pt.), max.	0.5

Also

genetron 11 ORANGE LABEL

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NOTE: The quality of current "Genetron" production consistently surpasses the rigid manufacturing specifications listed.

WASHDOWN HOSE

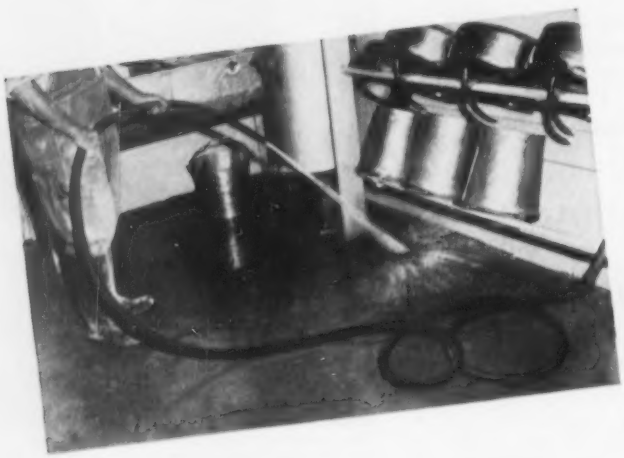
Washdown hose that's never a washout

FOR HOT WATER OR LOW-PRESSURE STEAM

For washing, cleaning and sterilizing equipment, this specially compounded **U. S. RAINBOW® CREAMERY HOSE (STYLE P-255)** has a white, strong and flexible cover, resistant to destructive effects of grease and lactic acid. Nozzle can be built integral to prevent chipping of fragile linings in tanks and sterilizers.

U. S. PACKER'S WASH-UP (STYLE P-7093) is very flexible, but very rugged. Four-ply carcass duck assures easy handling, perfect balance. Cover of black neoprene resists destructive action of animal fats, oils, and abrasion.

FOR COLD OR WARM WATER



U. S. PEERLESS® WATER HOSE (STYLE P-365) has a tube of extruded natural rubber to provide a smooth waterway. Carcass of braided rayon for longer life in high-pressure service. Highest grade brown cover is specially compounded for resilience, resistance to abrasion and other abuse. Particularly good for fruit and vegetable processing plants.

This attractively priced hose, **U. S. RAINBOW WATER HOSE (STYLE P-340)**, has a carcass of exceptional strength and flexibility, thanks to two braids of high-twist cabled rayon. Tough rubber cover resists abrasion from dragging or scuffing. Seamless tube of special rubber stock.

"U. S." Hose is available at any of the 28 "U.S." District Sales Offices, at selected distributors, or write us at Rockefeller Center, New York 20, N. Y.

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United States Rubber

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110 Navajo—deep warm red
200 Taupe—blended gray, flashed
175 Pompeian—light buff
170 Russet—vivid red-brown
240 Suntan—buff, golden tone
160 Oriental—dark red, flashed

For floors that can take it . . . everywhere . . .

No. 120 Mecca

Sizes: (with trim shapes): ½" thick—2¾" x 2¾" to 8" x 3¾". Available also where desired: ¾" thick—2¾" x 2¾" to 9" x 9". Also available with abrasive surface.

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Colorful floors of Carlyle Quarry Tile will remain fadeproof, fireproof and 100% serviceable for the life of your building. Scuffs, stains, grease, acids wash away — harmlessly, economically. Yet, the cost of Carlyle Quarry Tile floor is most reasonable, compared with any other floor material.

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Vaniprox **is the exclusive D&O Vanilla Oil, extracted from high grade Mexican or Bourbon beans, in a refined cane sugar base. Containing all the natural, oil-soluble flavor principles present in Vanilla, including color, fixed oils, resins, and aromatics,** ***Vaniprox*** **is a crystalline, non-hydroscopic Vanilla sugar with a delicious, full-bodied aroma . . . and will not cake or lump! When used in part with Vanilla Extracts,** ***Vaniprox*** **tends to accentuate and "fix" the true Vanilla characteristic in the finished product. The chart below outlines briefly some of its major uses. Trial quanities will be sent upon request . . . also the VANIPROX BROCHURE.**

PRODUCT TO BE FLAVORED	unit Batch of Product	OUNCES (AVOIRDUPOIS) OF VANIPROX SUGGESTED PER UNIT BATCH					
		Pure Bourbon Extra "A" (1 Fold)	Pure Mexican Extra "A" (1 Fold)	Pure Bourbon #29 (3 Fold)	Pure Mexican #29 (3 Fold)	Pure Bourbon #9 (8 Fold)	Pure Mexican #9 (8 Fold)
Chocolate Coatings	100 lbs.	-	-	4½ - 6	4½ - 6	1½ - 2 See*	1½ - 2 See*
Cocoa	100 lbs.	7 - 9	7 - 9	2 - 3	2 - 3	¾ - 1	¾ - 1
Ice Cream	100 lbs. Mix	8 - 12	8 - 12	3 - 4	3 - 4	1 - 1½	1 - 1½
Ice Cream Powder (4 oz. = 1 pt.)	100 lbs.	-	-	-	-	4 - 6	4 - 6
Chocolate Syrup	10 gals.	7 - 9	7 - 9	2 - 3	2 - 3	¾ - 1	¾ - 1
Cream Centers Caramels	100 lbs.	4 - 6	4 - 6	1½ - 2	1½ - 2	½ - ¾	½ - ¾
Pudding Powder	100 lbs.	-	-	6 - 8	6 - 8	2 - 3	2 - 3
Baked Goods	100 lbs.	6 - 9	6 - 9	2 - 3	2 - 3	¾ - 1¼	¾ - 1¼
Whipping Cream	100 lbs.	2 - 4	2 - 4	⅔ - 1⅓	⅔ - 1⅓	¼ - ½	¼ - ½
Oil Icings	100 lbs.	4 - 8	4 - 8	1½ - 3	1½ - 3	½ - 1	½ - 1

* It is suggested that one pound of #9 be mixed with 2 pounds of sugar, bitter chocolate, or cocoa butter, and this paste added to the coating on a basis of 4½ to 6 oz. to 100 pounds just prior to completion of grinding of chocolate mass.

Essentially for you

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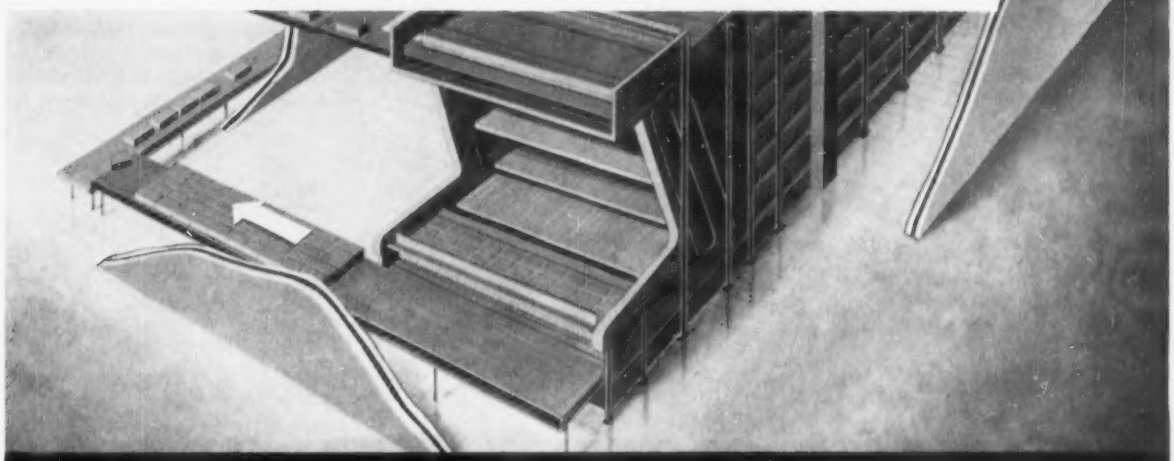
A NEW AND BETTER WAY TO HARDEN ICE CREAM WITH



THE GREER CONTINUOUS MULTI-TIER FREEZER

having features no other hardening system can match.

FASTER HARDENING

Results prove Multi-Tier processed ice cream is ready for palletizing or truck delivery in 4 hours or less — no delays — no rehandling! You'll gain greater production flexibility, lower inventories, increased profits.

SAVES LABOR

Gone is the time and labor of restacking or handling ice cream after hardening. A series of moving trays carry packages through hardening — automatically, continuously. All of product is exposed to uniform air velocity and conditions. Automatic loading and unloading.

HARDENING TUNNEL EFFICIENCY

. . . from floor to ceiling . . . continuously, automatically. Freezer shown packs over 2800 square feet of hardening area through the hardening cycle in floor space of only 10' x 64'. Variety of models to fit your plant and production requirements.

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Actual installations show GREER Multi-Tiers make ice cream hardening and other food freezing faster; save space, improve quality control.

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J. W. GREER COMPANY

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Sales Engineering Offices: Chicago, Ill., San Francisco, Calif.

GREER

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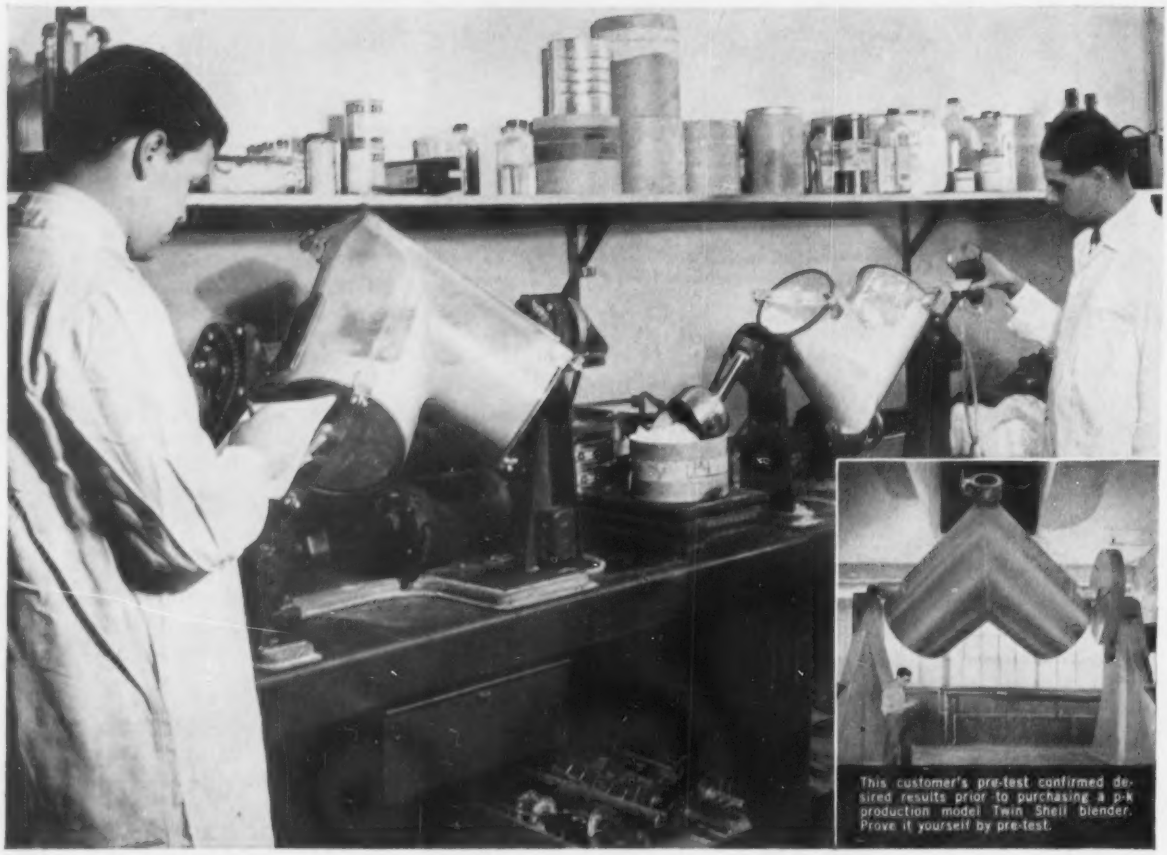
Norda, Inc., 610 West 26th Street
New York 1, New York

CHICAGO • LOS ANGELES • SAN FRANCISCO • TORONTO • MONTREAL • HAVANA • LONDON • PARIS • GRASSE • MEXICO CITY



This customer's pre-test confirmed desired results prior to purchasing a p-k production model Twin Shell blender. Prove it yourself by pre-test.

Pre-Tests "Guarantee" Performance of P-K Twin Shell Blenders*

There's never a question as to whether a p-k Twin Shell Blender will do the job. For p-k's "pre-test" service, described at right, removes all guesswork and *proves* that a p-k blender will give you the results you need . . . whether it be a standard model Twin Shell for gentle mixing action, an "Intensifier"* model for difficult-to-blend materials, or p-k's new "Liquid-Solids"* blender, designed for blending liquids into dry materials.

Actually this blending pre-test of your materials is just an extra safeguard. For p-k's remarkable Twin Shell blenders . . . with their unique blending action . . . probably have *already* proved their effectiveness on a job like yours.

Take a look at the V-shape of the shell. In every revolution there's a 5-way tumbling and mixing action *that you can't duplicate in any other blender.* Blending is fast, thorough, and results are consistently uniform.

Add to this the fact that clinical cleaning is a snap in the smooth, baffle-free, interior . . . that loading and discharge is simplified through the ample openings . . . that maintenance is negligible . . . and that blending results obtained with any p-k lab model (from 1 pint working capacity up to 8 quarts) scale-up to production sizes.

*Patented and Patents Pending

Investigate P-K's Blending Concept

P-K's Customer Service Laboratory will be pleased to test-blend your materials . . . preferably under your supervision. Material formulations will be blended to your exact specifications and returned for analysis, together with a complete report. P-K recommends pre-tests for all "Liquid-Solids" applications, because of the many variables that may effect blending procedures necessary for intimate dispersion of liquids in solids. Our Lab also conducts comparison tests in pilot models of all other basic blender types . . . from ribbon and double cone to p-k's standard Twin Shell and "Intensifier" models.

All of them are members of a growing family of p-k blenders and all are described in our new catalog 14. Write our Mr. R. T. Dotter for your copy . . . and arrange, too, for a pre-test of your materials.

The Patterson-Kelley Co., Inc., 1610 Hanson St., E. Stroudsburg, Penn.

Patterson-Kelley
Chemical and Process Division

P-K Twin Shell Blenders* • Heat Exchangers • Packaged Pilot Plants • P-K Lever-Lock Doors*

LOOK FOR THE
JENKINS DIAMOND

PROTECT YOUR VALVE INVESTMENT

Specify — and be sure you get

JENKINS

Renewable Composition

DISCS

MADE BY THE ORIGINATORS OF RENEWABLE DISC VALVES

Jenkins Bros. has remained the leader in composition disc development and production since 1864, when the first renewable disc valve was introduced.

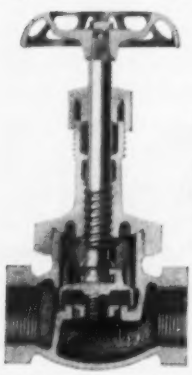
THE ONLY MANUFACTURER OF BOTH VALVES AND DISCS

Jenkins Bros. devotes continuous laboratory and field research to disc improvement through use of new compounds, and new production techniques.

NEW GUIDE FOR DISC SELECTION

Describes all Jenkins Discs, and their applications for steam, hot and cold water, air, gas, oil, gasoline . . . including the new TEFLON® DISC for lasting, dependable control of oxygen and other gases, solvents, acids, alkalies, and other chemicals,— and for liquid food and similar services.

Ask your Jenkins Valve Distributor for Disc Folder Form 203, or write: Jenkins Bros., 100 Park Ave., New York 17.



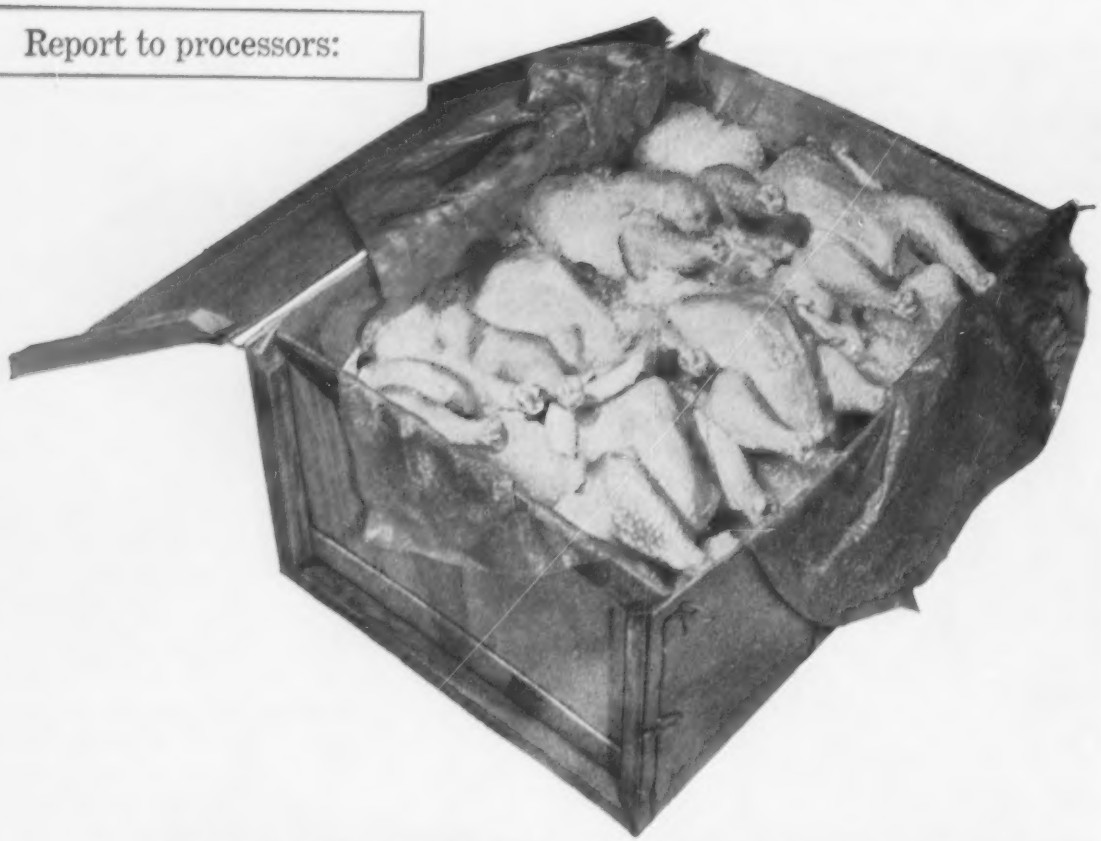
. . . for highest efficiency, use the time-proved combination . . . JENKINS DISCS in

JENKINS VALVES

TRADE JENKINS MARK
Jenkins Bros

Order from Your Local Jenkins Distributor

Report to processors:



BIOSTAT® ANTIBIOTIC

offers simple, profitable way for you to market poultry

If you are now using, or considering using antibiotic treatment to extend freshness time, you should know the important facts about BIOSTAT. It offers every poultry processor a number of unique advantages.

BIOSTAT is produced only by Chas. Pfizer & Co., Inc., world's largest producer of antibiotics, and a supplier of quality ingredients for the food industry for over a century. The active ingredient of Pfizer BIOSTAT—PA (poultry application) is the antibiotic oxytetracycline. In thousands of tests and in experimental work covering more than two years, BIOSTAT has proved extremely effective in delaying bacterial spoilage. Your chilled whole poultry will remain fresh 50-100% longer when BIOSTAT is added to chill tanks.

FDA ACCEPTED

BIOSTAT has been accepted by the Food and Drug Administration for use on poultry to retard bacterial spoilage. All trace of the antibiotic which protects freshness is destroyed by cooking.

With BIOSTAT treatment you will be sure that the retailer can offer consumers the freshest tasting birds possible. This will increase repeat sales . . . build his broiler business, *and yours!* With BIOSTAT treatment your retailers will also be able to order larger quantities of poultry from you with far less fear of spoilage from weekend carry-overs, or bad weather sales slumps.

You can use BIOSTAT when you freeze poultry, too . . . to retard bacteria before you freeze and after consumer thaws the bird.

PREPACKAGING

For the future, antibiotic treatment promises an extremely important development in poultry marketing — reduced labor cost by the elimination of cutting-up and tray-packaging at retail stores. Pfizer is now working on techniques of treatment that will make tray-packaging at your plant a practical reality. At the present time, any antibiotic

← For more data, circle this page number on card at back

EXTRA ADVANTAGES YOU GET WITH BIOSTAT

■ **FAST ACTING**—BIOSTAT has a high rate of solubility...dissolves *instantly* in chill tank water...*does not foam.*

■ **METAL CONTAINER**—BIOSTAT is delivered to you in special metal containers that *will not* absorb moisture...*will* keep product in good condition. The containers have polyethylene liners. Enclosed in each container is an *easy-to-use measuring scoop.*

■ **PLUS INGREDIENT**—BIOSTAT contains citric acid which increases acidity and thereby also helps inhibit bacterial growth.

■ **MORE CONCENTRATED**—BIOSTAT is a 20% concentration of antibiotic activity. This means you order less weight. It simplifies handling.

■ **SPECIAL SERVICE**—You will find details on this important "extra" below under the heading PFIZER POLICY.

BIOSTAT comes to you in a convenient, 1 gallon *metal* container with a polyethylene liner and a handy measuring scoop.

When you add BIOSTAT to your chill tank, you'll find it dissolves instantly. Does not foam.

TREATMENT

that stays fresh longer

cleared by the government for addition to the water in a poultry chill tank inhibits bacterial action on the surface of a whole bird. This type of treatment is very effective in delaying spoilage, but its maximum effectiveness lasts only until the bird is cut up and new surfaces exposed to bacteria.

PFIZER POLICY

Pfizer offers you a *free sample* of BIOSTAT (50 grams) and technical help in starting antibiotic treatment. In addition, Pfizer offers a special introductory wing clip service to aid processors in taking immediate commercial advantage of the benefits of BIOSTAT. **No promotional labeling of BIOSTAT is required. As in the past, Pfizer leaves control of end product merchandising to processors.**

Write to Pfizer today for your free sample of BIOSTAT and full details on how BIOSTAT antibiotic treatment can help you profit through marketing poultry that stays fresh longer.

Wing clips featuring your brand name carry only such labeling of antibiotic treatment as required by government.

Quality ingredients for the food industry for over a century

Pfizer

CHAS. PFIZER & CO., INC.
Chemical Sales Division
630 Flushing Ave., Brooklyn 6, N. Y.
Branch Offices: Chicago, Ill.; San Francisco, Calif.; Vernon, Calif.; Atlanta, Ga.; Dallas, Texas

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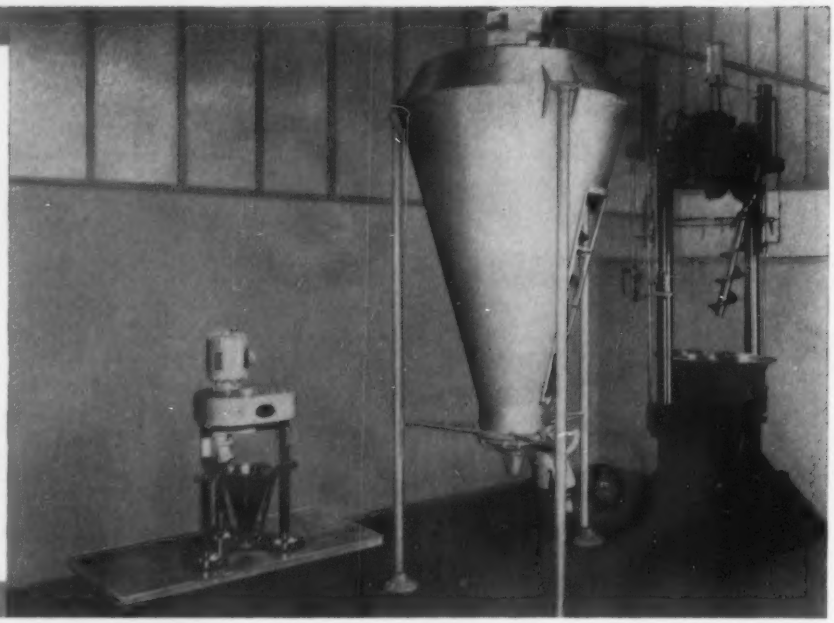
NOW quick, thorough mixing of dry products



with the NEW Nauta Mixer

Precessional motion of Nauta speeds production... cuts costs

Uniform, *quick* mixing of any number of dry materials in any proportions . . . wetting dry materials with small quantities of liquid . . . or dissolving solids in a liquid media . . . these are the exclusive features of the *new* Nauta Mixer. The gentle, yet positive action of the precessional motion of the Nauta intimately mixes products in any proportion . . . without dusting or change in their original characteristics.

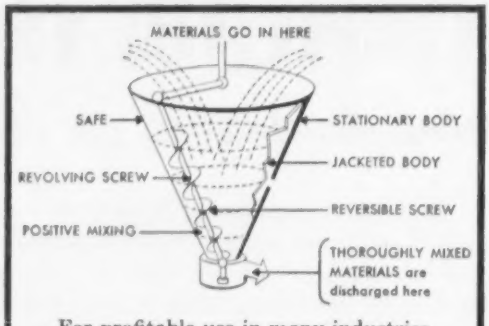
By shortening time cycles required for thorough mixing, the Nauta Mixer increases production. The revolutionary precessional motion means less power consumption. This is a combination that results in substantially lower costs.

Why not try the *new* Nauta Mixer in your operations? We will gladly send complete information on request.

Let us Pretest your product

A quantity of your product ingredients can be mixed under actual production conditions in a Nauta Mixer now in the Buflovak Research Laboratory and Testing Plant, with positive results. Let us tell you about this service.

ASK FOR BULLETIN NO. 374



For profitable use in many industries

The advantages of Nauta Mixers can be enjoyed wherever dry materials require thorough mixing.

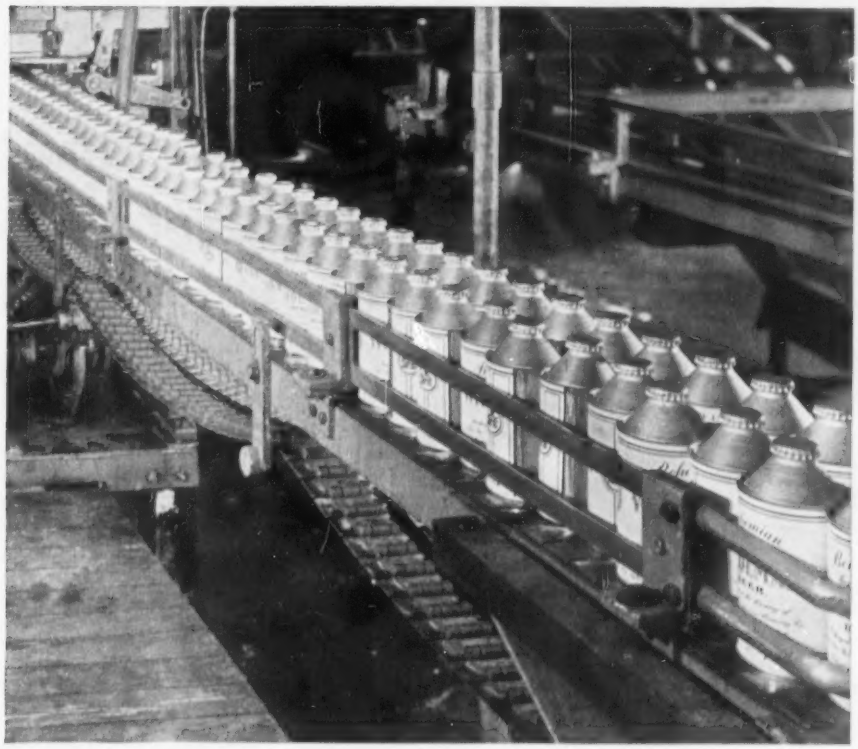
Agricultural products	Meat
Ceramic materials	Metal powders
Chemicals	Paint pigments
Cosmetics	Pharmaceuticals
Dissolving viscose rayon	Resins and plastics
Fertilizers	Seeds
Fish meal	Sizing compounds
Flour	Starch
Food products	Sugar
Insecticides	Many other products
Latex mixed with chemicals	

The Buflovak Equipment Division of Blaw-Knox Company is the exclusive licensee for the Nauta Mixer. It is built to the same exacting standards for which Buflovak is famous in building evaporators, dryers, autoclaves, kettles and other equipment.

50th Anniversary
BLAW-KNOX
1906-1956

BLAW-KNOX COMPANY
Buflovak Equipment Division, 1631 Fillmore Avenue, Buffalo 11, N.Y.

Link-Belt S-815 flat-top chain improves food container handling



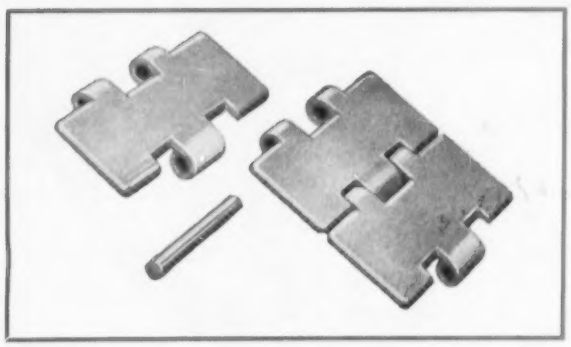
Offers conveying flexibility—simplifies assembly, maintenance

Link-Belt S-815 flat-top chain presents a safe, smooth conveyor path for handling food and beverage bottles, cans and similar containers through washing, filling, capping and other operations. Designed to simplify conveying in bottling plants, canneries and dairies, S-815 chain is readily adaptable to new or existing machines.

One-piece links are formed from steel strips and connected by steel pins. Top edges of links are beveled to permit free movement of containers across the surface. Pins can be quickly removed for easy maintenance and chain adjustment.

Available in five widths—in carbon or stainless steel. And its simple design eliminates dirt-catching pockets and crevices—an important feature where sanitation is essential.

LOW-COST S-815 flat-top chain conveys cans of beer from filling and capping machine. Smooth, unbroken carrying surface of chain reduces danger of tipping.



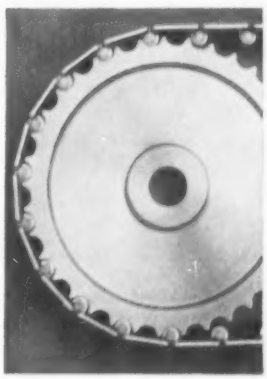
One-piece S-815 link serves as integral carrying platform

One-piece links, with beveled edges, dovetail with adjacent links to form a smooth, continuous carrying surface. Elimination of the straight-line lateral gap between links removes the danger of tipping or jamming stalled containers, permits chain to slide freely under them. Chain can be detached at any convenient pitch by merely removing the connecting pin. Ask for Folder 2344.

Unique design of S-815 sprockets doubles life

Specially designed cut-tooth sprockets for Link-Belt S-815 flat-top chain provides twice the necessary number of teeth, doubling wheel service life. This design refinement insures close control of tooth profile and dimensional specifications, resulting in proper chain engagement . . . minimum wear . . . quiet, smooth operation.

In operation, links contact every other tooth. Odd number of teeth in sprocket automatically distributes wear. However, similar service can be obtained with even number of teeth by periodically indexing the sprocket one tooth.



HEADQUARTERS FOR CHAINS, SPROCKETS is your nearby Link-Belt factory branch store or authorized stock-carrying distributor. Write for 342-page Catalog 950.

LINK-BELT

CHAINS AND SPROCKETS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office: New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 14.200

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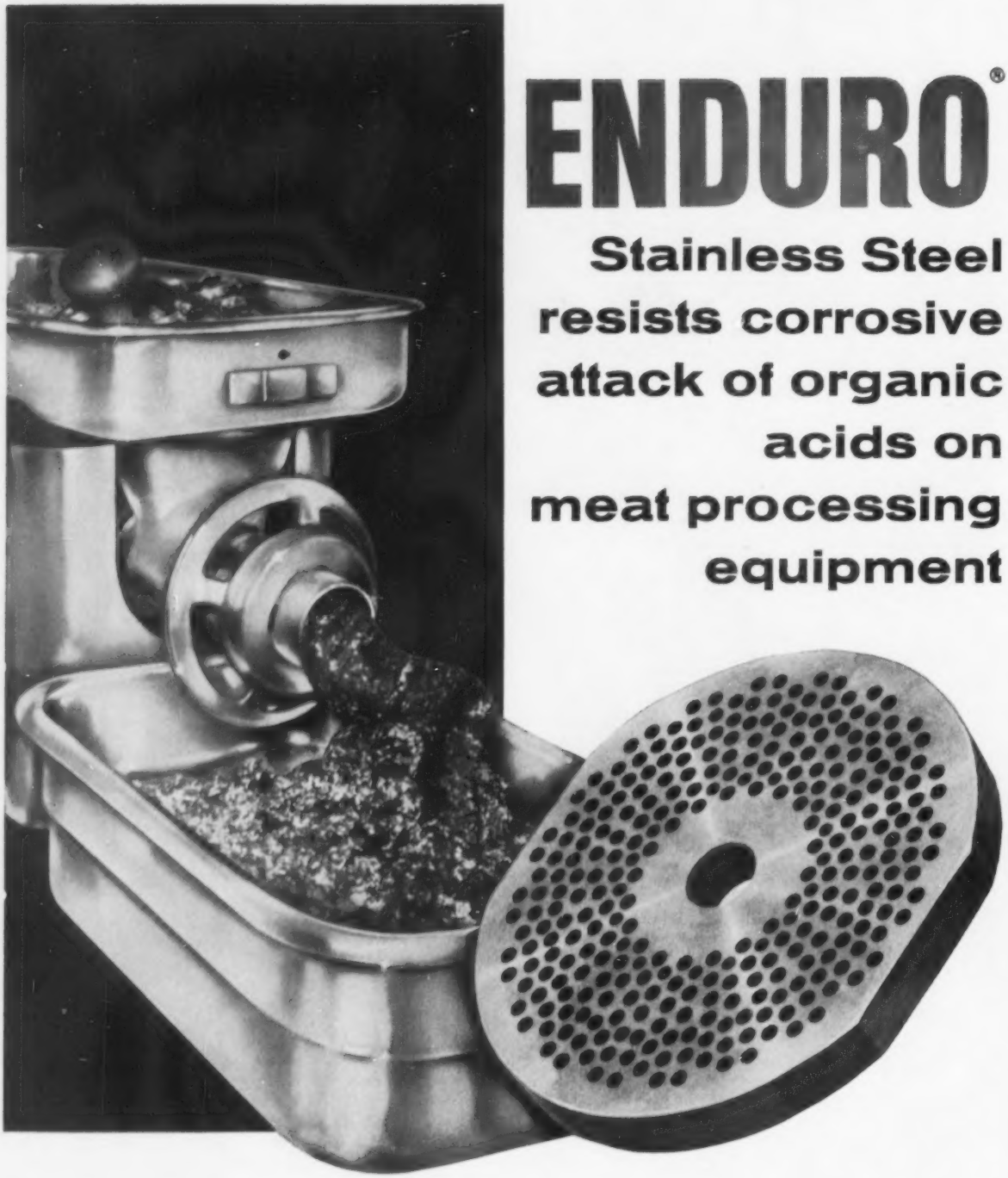

ENDURO®

Stainless Steel resists corrosive attack of organic acids on meat processing equipment

REPUBLIC

World's Widest Range of Standard Steels

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Corrosion, caused by meat and fish acids, has always been a serious problem for meat packing plants, locker plants, hospitals, hotels, institutions, markets . . . and any other place where cleanliness, sanitation and appearance are absolute musts.

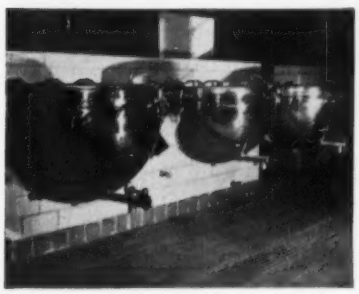
Because meat and fish acids are organic, they readily attack ordinary materials used in fabricating meat processing equipment. The Biro Manufacturing Company, Marblehead, Ohio, has licked the corrosion problem with the help of Republic ENDURO Stainless Steel.

All parts in their line of power meat cutters and choppers coming in contact with meat or fish, like the chopper plate shown at left, are fabricated from ENDURO. This means that corrosion is locked out. ENDURO's smooth, hard surface offers little foothold for contaminants or bacteria. ENDURO is solid stainless steel all the way through with no applied surface to crack, chip, flake or peel away.

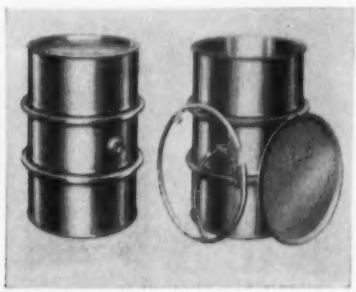
Ease of cleaning is another advantage of ENDURO-made meat processing equipment. Usually a simple washing with soap and water rids the equipment of all residue and readies it for the next operation. And there's never any danger of metallic contamination. ENDURO never adds unwanted flavor. It never takes anything away.

ENDURO in any food processing operation means long-range economies. It will take persistent abuse and still maintain its sanitary appearance, strength and corrosion-resistance. Your equipment supplier has all the facts on how ENDURO can cut your maintenance costs and safeguard the quality and purity of your product. Or send the coupon for more information.

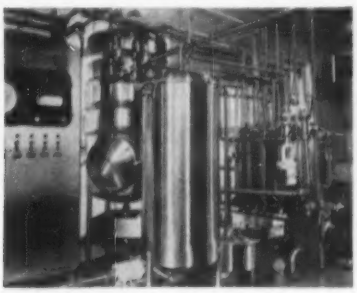
THE WORLD'S FIRST Stainless Steel Power Meat Cutter was made from ENDURO by The Biro Manufacturing Company. It features maximum resistance to corrosion and provides all types of meat processing operations with absolute sanitation and the finest appearance.



WHAT'S EVEN MORE CORROSION-RESISTANT than stainless steel? Republic Titanium. It is practically immune to the corrosive effects of salt water. This could mean tremendous savings for meat processors and food packers using salt or brine. Republic is working closely with equipment manufacturers on new developments utilizing all the advantages of Titanium. Write us for more information.



MAXIMUM PROTECTION AGAINST CORROSIVE ATTACKS on food products in transit or in storage is provided by Republic ENDURO Stainless Steel Barrels and Drums. There's no danger of contamination or discoloration. ENDURO Barrels and Drums will withstand hard use and abuse. They resist denting and never need painting. Available in 30- and 55-gallon capacities.



CORROSION IS HELD IN CHECK by Republic ELECTRUNITE® Stainless Steel Tubing and Pipe. And, because they are corrosion-resistant and have a wide range of resistance to temperature, pressure and physical damage, they will last indefinitely. You receive positive assurance that there will be no contamination or discoloration of food, beverages or dairy products transported through ELECTRUNITE Stainless Steel Tubing and Pipe.

STEEL

and Steel Products

REPUBLIC STEEL CORPORATION
Dept. C-1782
3160 East 45th Street
Cleveland 27, Ohio

Send more information on these Republic Products for food processing.

☐ ENDURO Stainless Steel
☐ ENDURO Barrels and Drums ☐ Titanium
☐ ELECTRUNITE Stainless Steel Tubing and Pipe

Name_____ Title_____
Company_____
Address_____
City_____ Zone____ State_____

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How Sunkist helps you...

In every field of food processing, new contributions are being made toward tomorrow's better foods. Look at these typical Exchange Brand developments, based on 50 years of Sunkist research.

EXCHANGE
OIL OF LEMON

Unmatched quality and flavor that come only from quality California lemons . . . grown and skillfully processed by exacting Sunkist standards. The 4-to-1 favorite over **all other lemon oils combined!**

EXCHANGE
PRESERVER'S PECTIN

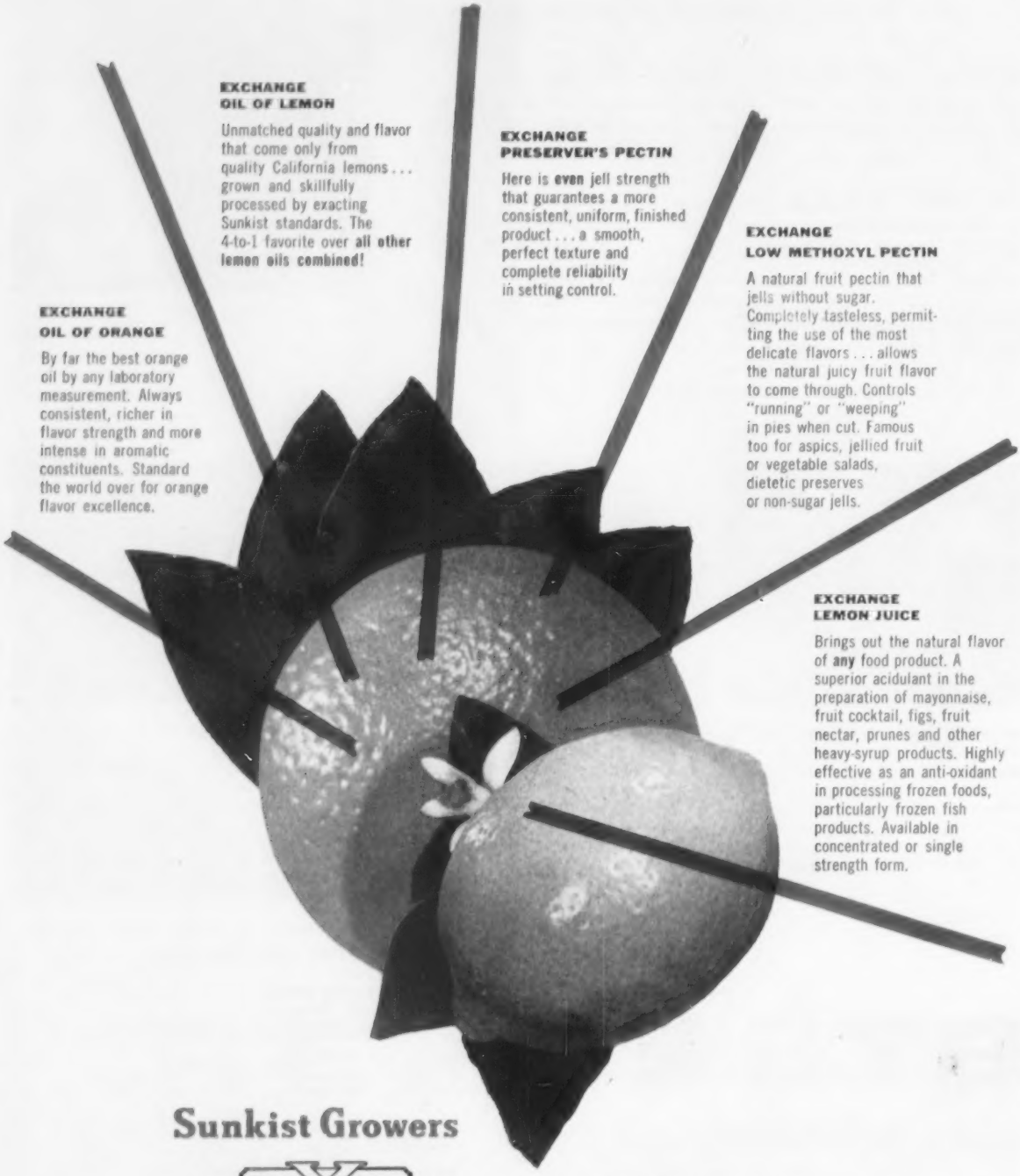
Here is **even** jell strength that guarantees a more consistent, uniform, finished product . . . a smooth, perfect texture and complete reliability in setting control.

EXCHANGE
OIL OF ORANGE

By far the best orange oil by any laboratory measurement. Always consistent, richer in flavor strength and more intense in aromatic constituents. Standard the world over for orange flavor excellence.

EXCHANGE
LOW METHOXYL PECTIN

A natural fruit pectin that jells without sugar. Completely tasteless, permitting the use of the most delicate flavors . . . allows the natural juicy fruit flavor to come through. Controls "running" or "weeping" in pies when cut. Famous too for aspics, jellied fruit or vegetable salads, dietetic preserves or non-sugar jells.



EXCHANGE
LEMON JUICE

Brings out the natural flavor of **any** food product. A superior acidulant in the preparation of mayonnaise, fruit cocktail, figs, fruit nectar, prunes and other heavy-syrup products. Highly effective as an anti-oxidant in processing frozen foods, particularly frozen fish products. Available in concentrated or single strength form.

Sunkist Growers

Exchange®

PRODUCTS DEPARTMENT • ONTARIO, CALIFORNIA

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B.F.Goodrich

Pecans by the ton travel on B. F. Goodrich belts

A typical example of B. F. Goodrich product improvement

THREE tons of shelled pecan meats a day flow through this plant—twice as much in peak seasons. But belts were being replaced every four to six months.

Keeping them clean took time and money. Oil from the nuts soaked into the belts. Some belts got soft and sticky. Others hardened and cracked. All kinds of belts from many manufacturers were tried.

Then a B. F. Goodrich distributor heard about the problem. He recommended B. F. Goodrich belts made of Koroseal flexible material, and the trouble disappeared like magic. B. F. Goodrich had developed a belt that stands nut meat oils, cooking oils, animal fats, most acids and just about everything else that ruins belts. The belts are as clean as your dishes at home and just as easy to wash. They have no odor, no taste, never get rancid. Food particles, even shells, can't grind in. In the pecan plant these belts had already lasted 50% longer than any others when this picture was taken, and still looked good for years of service.

Other kinds of B. F. Goodrich belts handle iron ore, coal or rocks instead of pecan meats. B. F. Goodrich has also made improvements in those longer, heavier belts to make them last longer, save money for users. B. F. Goodrich has made improvements in V belts, in dozens of kinds of hose and just about every other kind of industrial rubber product. If you use any kind of rubber, call your B. F. Goodrich distributor. Let him tell you which B. F. Goodrich product will do your job best. Or write *B. F. Goodrich Industrial Products Company, Dept. M-786, Akron 18, Ohio.*

Koroseal—T. M. Reg. U. S. Pat. Off.

B.F.Goodrich

INDUSTRIAL PRODUCTS

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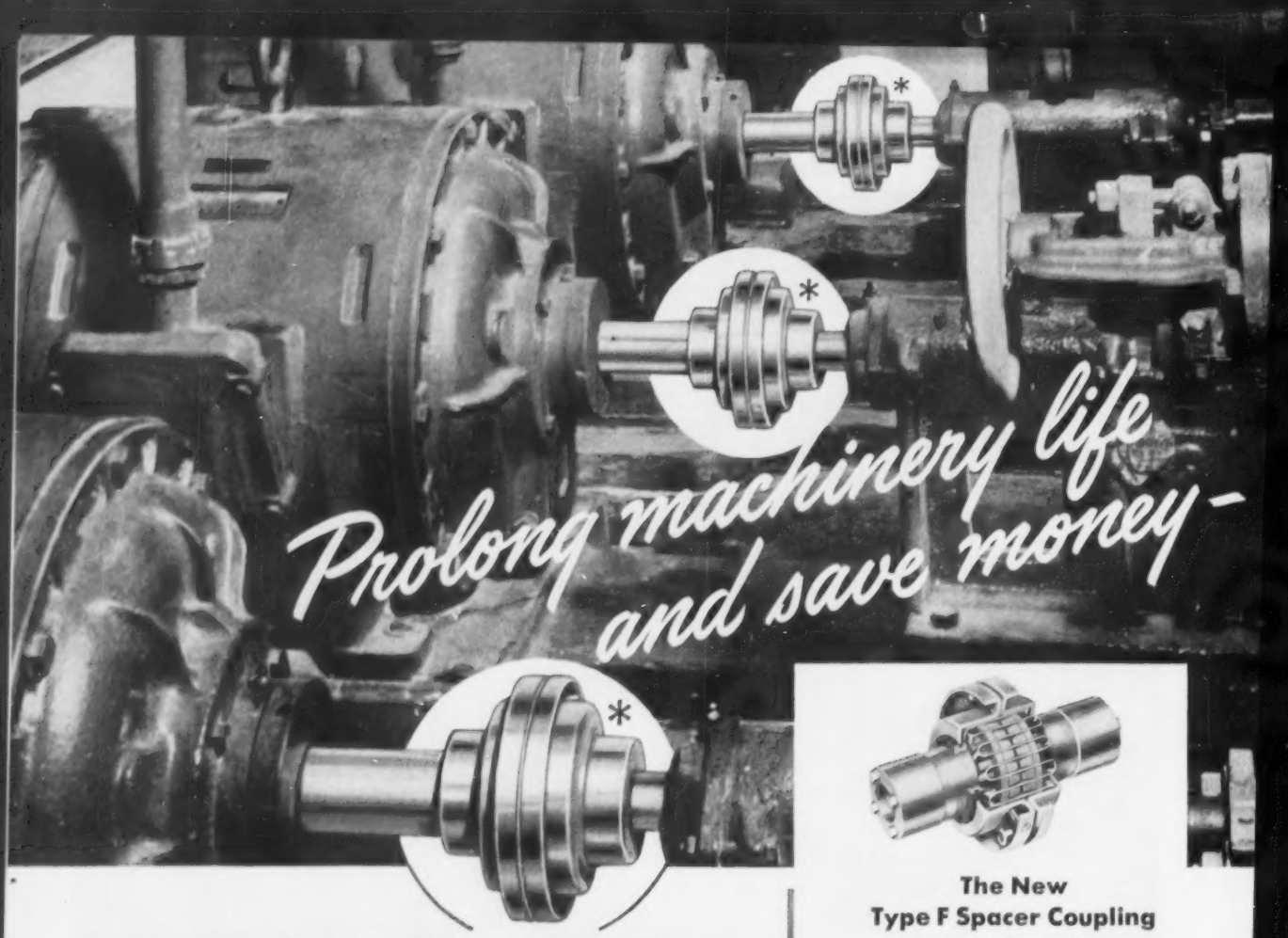


with FALK Steelflex Couplings

Ever since the first Falk Steelflex Coupling was designed and built, we have firmly held to these beliefs:

1. A coupling, to give fullest value, must do more than merely *connect* driving and driven machinery—it must *protect* the machinery and prolong its life.

2. A coupling, to be truly flexible, must overcome the effects of shock and vibration, as well as shaft misalignment.

Proof of the soundness of those beliefs is furnished by the record. More than one million Falk Steelflex Couplings have been used on every conceivable type of industrial application . . . giving trouble-free service, providing maximum protection to connected machinery.

* A single basic type—the famous Type F—fills 90% of all industrial application needs. It is versatile, efficient and economical. And—it is always available from factory, field or distributor stocks, in a wide range of sizes.

Write to Department 247 for engineering bulletin, including selection and dimension tables.

THE FALK CORPORATION, MILWAUKEE, WISCONSIN

MANUFACTURERS OF:

- Motoreducers
- Speed Reducers
- Flexible Couplings
- Shaft Mounted Drives
- High Speed Drives
- Special Gear Drives
- Single Helical Gears
- Herringbone Gears
- Marine Drives
- Steel Castings
- Weldments
- Contract Machining

FALK

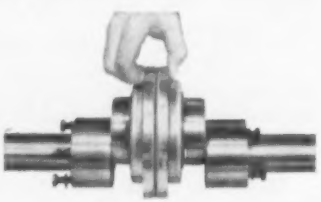
...a good name in industry

The New Type F Spacer Coupling

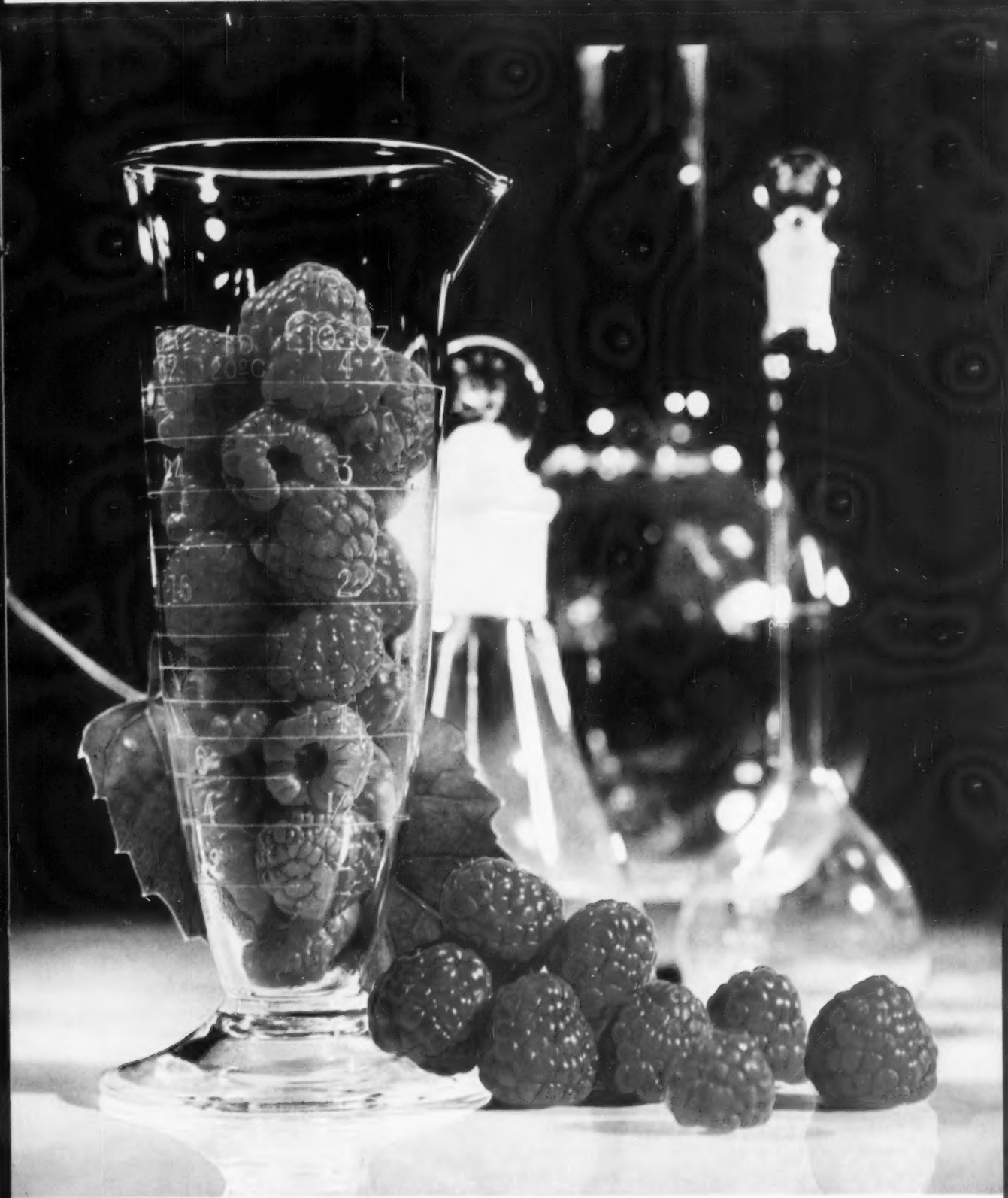
Here is a Steelflex coupling specially designed to permit fast, easy installation and removal in horizontal and vertical applications where it is impracticable to move the connected units—or where a space-gap (up to 12 in.) is necessary.

Like all Steelflex couplings, the Type F Spacer gives long, trouble-free service and maximum 3-way protection for connected machinery: it provides torsional resilience to reduce shock and vibration; it accommodates parallel or angular shaft misalignment; it allows free (or limited) end float.

An outstanding feature of the Steelflex Spacer is that it can be installed or removed in one piece (see photo below); no dismantling or servicing of the coupling is required. Pump assemblies can be disconnected and removed without disassembling the coupling, without exposing working parts.



The Steelflex Spacer coupling is prelubricated at the Factory and can be installed, or removed and reinstalled, without disturbing the lubricant—a highly desirable feature.



IMITATION RASPBERRY BY FIRMENICH

You get the direct and authentic reproduction of raspberries in their full perfection in Raspberry Flavor by Firmenich. For Firmenich took fully ripe raspberries, freshly severed from the stem, captured their delicate and fugitive flavor, and by original research reconstructed it with all its significant and desirable components. Firmenich Raspberry comes to you as a precise and potent flavor material of the utmost purity and stability to enhance the flavor of your products and to give them greater sales appeal. Samples and technical data on request.

FIRMENICH & CIE
SUCCESSEURS DE
CHUIT, NAEF & CIE
GENEVE SUISSE

FIRMENICH INCORPORATED

Making control look easy

in automatic proportioning

These Richardson Scale Company technicians have an important job . . . checking out a remote control panel for a Richardson Select-O-Weigh Proportioning System. Large units or small, like this one—all get the same thorough pre-shipment test. Here accurate proportioning is made to look easy—just a matter of setting a dial. But there's *more* to automatic control than a control panel . . . much more!

Richardson engineers know that accurate control of material flow and exact proportioning *depend as much on precise design of storage bin, feeder, and scale* as they do on electronic perfection. The storage bin must be properly sloped to prevent bridging or flushing; the feeder must provide positive, consistent material movement; the scale must weigh accurately to within superfine tolerances. And all must be integrated to insure a dependable, correlated performance—without human supervision all along the way!

The value to you of a Richardson Select-O-Weigh system lies in the quality of your finished product . . . both now and for year after profitable year. Protection of that quality is worth greater consideration than initial cost (and Richardson costs less on a value per dollar basis). It is worth your thorough analysis of the proportioning system itself! Richardson invites you to analyze—and specify—Select-O-Weigh. Send for Bulletin 0351 for more information.

When it comes to proportioning, you're in good company when you come to Richardson. Look at some of the others who now have *proportioning by Richardson*:

The Firestone Tire & Rubber Company • General Foods Corp.
General Electric Company • U. S. Bureau of Mines
Reynolds Metals Company • American Rice Milling Co., Inc.
Union Carbide & Carbon Corporation • Ford Motor Co.
Fleischmann Distilling Corp. • The Flintkote Company
Johnson & Johnson • National Distillers Products Corp.
Owens-Illinois Glass Co. • Pittsburgh Coke & Chemical Co.
Celanese Corp. of America • Goodyear Tire & Rubber Co.
E. I. Du Pont de Nemours & Co., Inc. • and many more.

Richardson

MATERIALS HANDLING BY WEIGHT SINCE 1902

RICHARDSON SCALE COMPANY
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Philadelphia • Pittsburgh • San Francisco • Wichita • Montreal
Toronto • Havana • Mexico City • San Juan

Richardson Scales S.A. 1-3 Rue de Chantepoulet,
Geneva, Switzerland

BIG SPEED-UP in vital office paper work is reflected by happy smile of Giovanni Buitoni, company president and author of this article. In his hands are right-to-the-minute, machine-printed costs and sales analyses—proof that the old lag has been licked. Equally pleased are (l. to r.) Vice-President Cuneo, Executive V.-P. Benz, and Board Member Mongillo.

Fully Mechanized Accounting Earns Them Triple Dividends

Data-processing IBM system coordinates Buitoni's production, sales, and credit control by providing . . .

- **Daily status of inventories, shipments, and costs**
- **Current records of receipts and accounts receivable**
- **Efficient monitoring of delinquent accounts**

GIOVANNI BUITONI

President, Buitoni Foods Corp., S. Hackensack, N. J.

PUNCH-CARD ACCOUNTING now enables us to process all our Butoni invoices and shipments the very same day the orders are received.

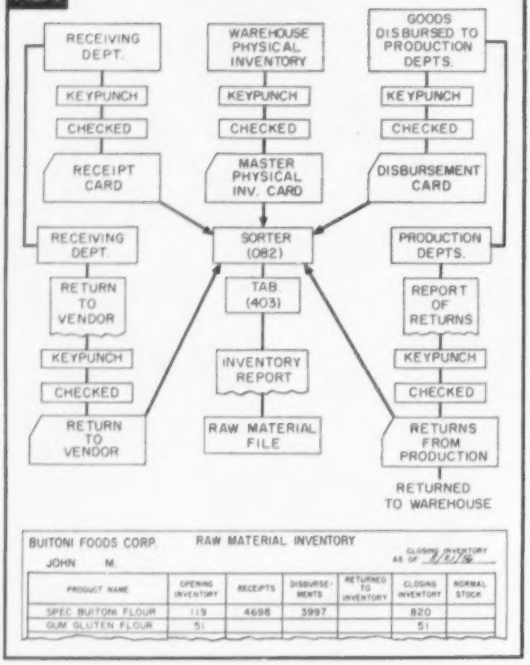
Moreover, this system of accounting machines and data-processing punch cards gives us all the up-to-date information needed for a flexible production program that keeps capital investment usefully employed. Also, it permits efficient control of credit and collections.

Thus we now know—daily—the status of sales, inventories and shipments, cash receipts and accounts receivable, delinquent accounts, sales analyses, and just about anything else concerning our operations.

Faster billing procedures have narrowed the gap between investment and receipts. About 90% of accounts receivable are now in the current month's column—an important factor in turning over fresh inventories. Of course, the quicker cash comes in, the more can be directly re-invested.

System inventories raw materials

FIG. 1



BUITONI FOODS CORP. RAW MATERIAL INVENTORY

JOHN M.

PRODUCT NAME	OPENING INVENTORY	RECEIPTS	DISBURSEMENTS	RETURNED TO INVENTORY	CLOSING INVENTORY	NORMAL STOCK
SPEC BUITONI FLOUR	119	4698	3997		820	
GUM GLUTEN FLOUR	51				51	

FLOWSHEETS for major accounting operations and typical tabulated reports. Figs. 1 & 2: Raw-material and finished goods inventories are taken from master punch cards. Reports (below each chart) are automatically printed daily. Fig. 3: Invoices are processed by consolidating information from salesman's order (A) with various customer data on punch card (B). Invoice (C) is then tabulated and printed by the 403 unit.

But we didn't always have this notable performance **in our inventory- and invoice-handling routines.**

PROBLEM AND SOLUTION

Although Buitoni products had been exported to the U. S. since the early 1900's, we didn't begin manufacturing them in America until 1940. Then consumer response grew so rapidly that, in less than ten years, conventional handling of inventories, invoices, and shipments could no longer efficiently keep pace with expanding sales.

Just typing of invoices, for example, kept personnel working overtime. Then the shipping department, idle for much of the day, had to stay late to get out the orders—most of which were for shipment the same day. Frequent errors were inevitable.

Moreover, taking inventories of raw materials, finished goods, and packaging items was a difficult and time-consuming job. Worse yet, many accounts became delinquent because their current status could be checked only periodically by our manual methods.

Then came the big decision: We transferred the work load from our clerks to machines (International Business Machines Corp., N. Y. C.). And here is what this system produces, swiftly and accurately:

1. Daily inventories of raw materials, packaging items, and finished goods.

2. Daily invoices and shipping orders, closing records of billings and cash receipts, and a sales report (including month's sales to date).

3. Monthly statements, including aged accounts receivable—right on the last day of the month—along with monthly cost and sales analyses.

The accounting machines (IBM supplies them on a rental basis) accomplish these tasks with only about half the personnel required by our former clerical method. A number of our employees, therefore, have been re-assigned.

And this new efficiency has been extended down the line. Although business has greatly increased, the same shipping force is still able to handle all orders efficiently.

We were so impressed with the performance of this system in our S. Hackensack plant that these machines have now been installed in all of our European plants.

Now to the way in which the above data are amassed, collated, tabulated, summarized, distributed, and filed.

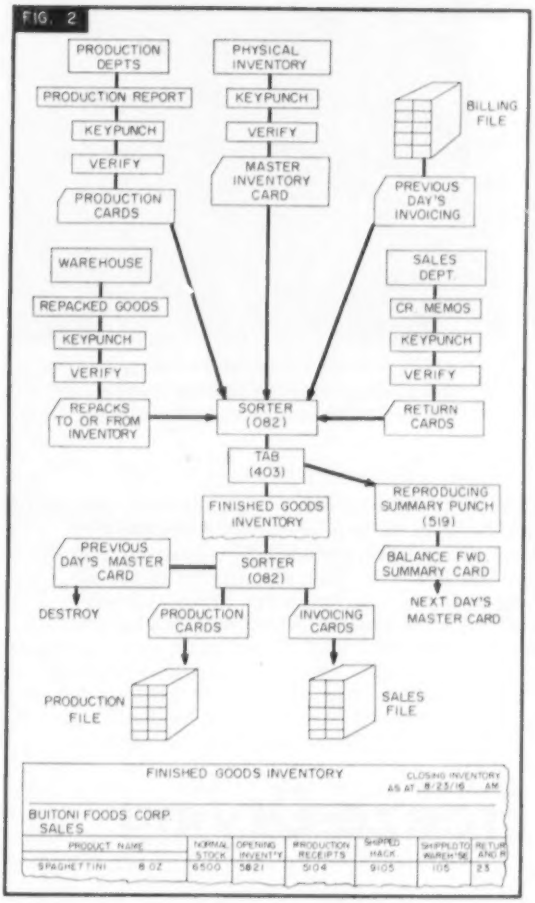
INVENTORIES—RAW MATERIALS, FINISHED GOODS

The raw-material inventory, once taken physically, is recorded on separate master punch cards by commodities. They range from ingredients (bulk flour, oils, spices, meats, vegetables) to packaging materials (alu-

AUTOMATIC INVOICING: This accounting machine (IBM 403) takes data from punch cards, then itemizes, extends, calculates, and prints totals. Unit employes interchangeable frames (rear) in processing invoices.

. . . and finished goods

FIG. 2



minum trays, cellophane sheets, wrappings, corrugated board, cartons, labels)—more than 150 items in all.

As indicated in Fig. 1, similar cards are made daily for all receipts, disbursements to production, returns to vendor or to warehouse—each by product name, code number, and quantity. At the close of the day, the accounting machine runs these cards (together with master cards) and a tabulated inventory report is automatically printed on a roll that divides into seven or more sections. This report lists product name and code number, opening inventory, receipts, disbursements, returned to inventory, closing inventory, and normal stock.

Daily comparison of closing inventory with normal stock forestalls any possibility of a production lag for lack of raw materials.

The finished-goods inventory encompasses some 130 products. There are over 60 different packaged macaroni products and 37 in bulk, produced in various forms, sizes, and shapes. In addition, there are 33 other canned products—meat, sauces such as marinara, mushroom, and pizza, also combinations as spaghetti and meat balls, meat and cheese ravioli, parmesan cheese and frozen ravioli and lasagne.

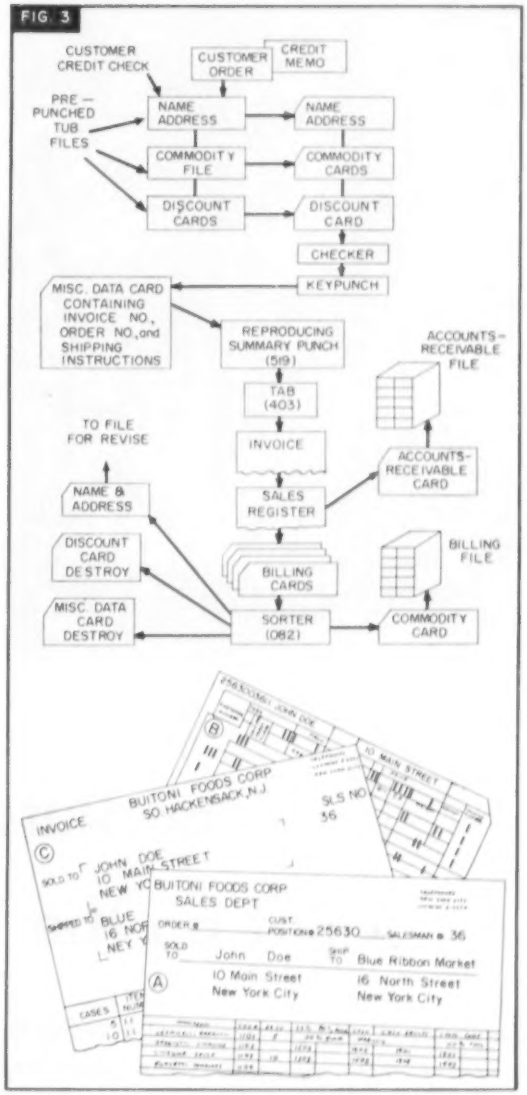
Warehousing such production could become a serious problem if the daily finished goods inventory did not tell us where we stood at all times, thus guiding us in production planning. Such decisions as which dies to use for macaroni products and which sauces to make rest on this report. Together with our daily raw-material inventory, it serves to guide us in our purchasing operations.

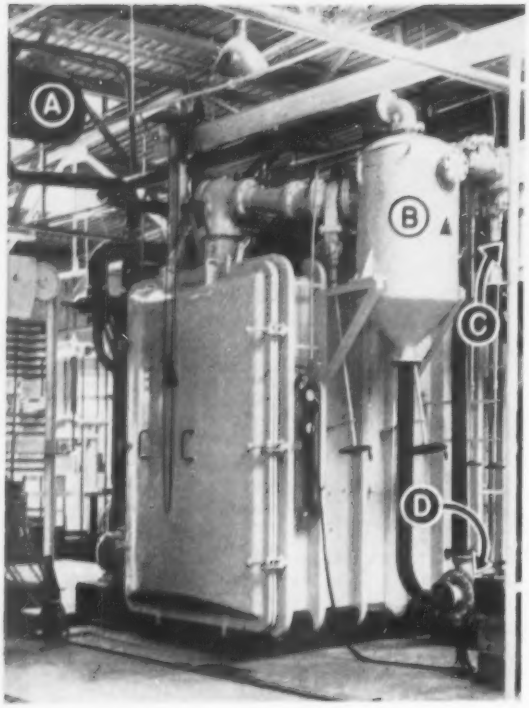
Fig. 2 illustrates the IBM procedure in making up the daily finished-goods report. It tabulates each product under columns, headed Normal Stock, Opening Inventory, Production Receipts, Shipped to Customers from Hackensack, Shipped to Warehouses, Transfers Between Customers, Hackensack Closing Inventory, Shipped to Customers from California, Shipped to Customers from Florida, and All Shipments to Date.

(Turn to page 206)

. . . also handles invoicing

FIG. 3





FIRST STEP in this new low-temperature process is batch freezing of the item to be dehydrated, in this case, steak . . .

COMPACT FREEZE DRYER operates at 0.21 psia., handles 700-lb. charge in about 6 hr. Foods placed on metal contact plates go into racks of rail-riding car (partially visible at left). Then plates are loaded into the vacuum dryer. Unit's accessories include: Expansion tank (A), jet condenser (B), water ejector (C), and condensate pump (D).

This Unit Puts Freeze-Drying Right on the Processing Line

Britain's vacuum dryer sets new high in quality of dehydrates. Operation guards foods' flavor and nutrients, permits full reconstitution. Equipment's design and action detailed

McGRAW-HILL WORLD NEWS
London, England

COMMERCIAL PRODUCTION of quality dehydrates—by freeze-drying in a new vacuum-contact unit—is now under way at Kestrel Products Ltd., Aberdeen, Scotland.

Fish, steaks, chops, fruits, and vegetables reportedly are being processed with a degree of flavor retention not obtainable by conventional canning or freezing methods.

A special application of this vacuum dryer is in meat-bar production, details of which are shown on the accompanying flowsheet. These bars consist of a seasoned blend of dehydrated beef and pork, and are packaged in laminated pouches.

The various items can be stored for long periods in all climates without refrigeration, dried meats remaining edible in the tropics for six months. This is of particular importance to Kestrel, which has started supplying West Africa with dehydrated fish.

Ease of reconstitution is another plus-factor. It's said that soaking these dehydrates in water for just a short time fully restores the foods to original flavor and consistency, with nutritional values intact.

Key to the freeze-drying process is low-temperature operation under high vacuum (FE Sept. '54, p. 74). Moisture in the frozen product is converted directly to water vapor without passing through the liquid phase. Thus, drying foods at low temperature prevents denaturization of proteins (which makes reconstitution difficult), and retards enzymatic and bacterial activity.

A charge of 700 lb. (wet weight) can be dehydrated in about 6 hr. In the case of fish, final moisture is approximately 5%.

Kestrel's drying plant, developed in cooperation with Britain's Ministry of Agriculture & Food, consists of a

. . . NEXT, frozen steaks are spaced on contact plate, which has internal passages for circulation of hot or cold water. Technician checks meat for uniform thickness.

FINISHED PRODUCT retains original flavor and nutrients. Packed in cans, it withstands six months' storage in tropical climates and is easily reconstituted.

vacuum cabinet with auxiliary heating and vacuum systems. Surprisingly compact, it occupies only 13x19 ft. of floor space, excluding the steam boiler.

Dryer Construction, Controls

Foods to be dried are placed between hydraulically actuated contact plates, which have internal passages for circulation of hot or cold water. Operating conditions (temperature, vacuum, and mechanical pressure) are rigidly controlled to assure rapid dehydration without "cooking" or otherwise impairing the item's capacity for proper reconstitution.

The vacuum cabinet is a mild-steel, welded cylinder about 5 ft. long and of 6 ft. dia. It has hinged doors at both ends, and valves for pressure-relief and vacuum-breaking. Cylindrical headers, welded into the cabinet, are connected to the plates by means of flexible tubing.

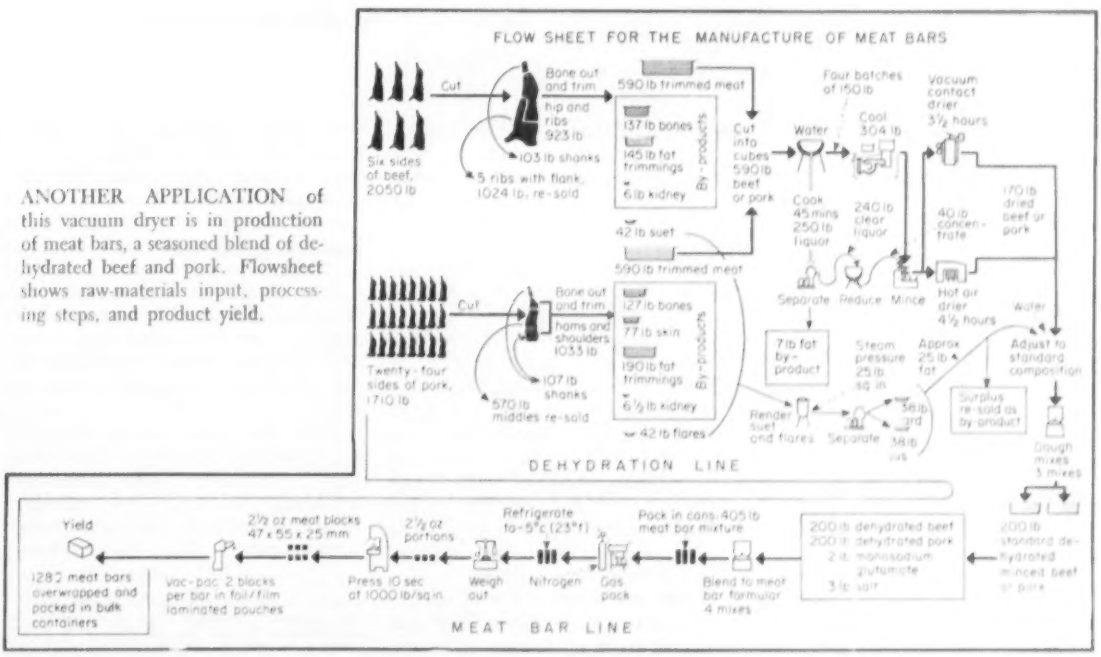
An instrument panel houses gages for water temperature and pressure, oil pressure in the hydraulic system, and vacuum in the cabinet.

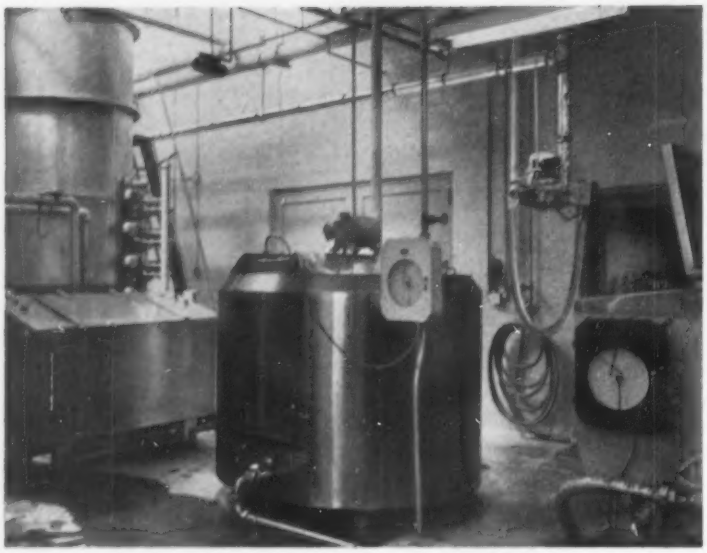
There are 18 contact plates arranged in parallel, each measuring about 2½x5 ft. Temperature is controlled by passing hot water through them during evaporation, cold water for final cooling. Each plate has a valve to permit circulating fluid to be precisely controlled.

Pressure is applied evenly through each plate and is controlled by adjusting external valves, which also open the plates at the end of the process. The hydraulic mechanism is located inside the vacuum chamber and operated by a pump at the back of the cabinet.

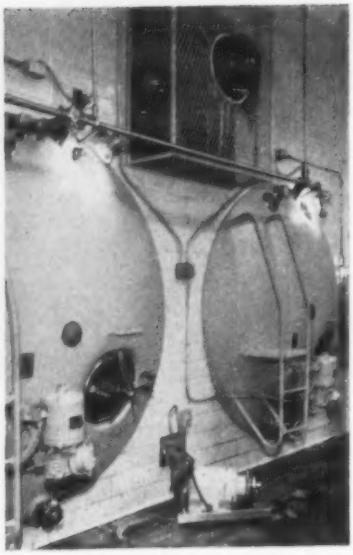
Turn to page (143)

ANOTHER APPLICATION of this vacuum dryer is in production of meat bars, a seasoned blend of dehydrated beef and pork. Flowsheet shows raw-materials input, processing steps, and product yield.


FLOW SHEET FOR THE MANUFACTURE OF MEAT BARS
Six sides of beef, 2050 lb
Cut
Bone out and trim
hip and ribs 923 lb
103 lb shanks
5 ribs with flank, 1024 lb, re-sold
590 lb trimmed meat
137 lb bones
145 lb fat trimmings
6 lb kidney
By - products
42 lb suet
590 lb trimmed meat
Cut into cubes 590 lb beef or pork
Water
Four batches of 150 lb
Cook 45 mins 250 lb liquor
Cool 304 lb
240 lb clear liquor
Vacuum contact drier 3¼ hours
40 lb concentrate
170 lb dried beef or pork
Separate
Reduce
Mince
Hot air drier 4½ hours
Water
Adjust to standard composition
Twenty-four sides of pork, 1710 lb
Cut
Bone out and trim
hams and shoulders 1033 lb
107 lb shanks
570 lb middles re-sold
127 lb bones
77 lb skin
190 lb fat trimmings
6½ lb kidney
By - products
42 lb flares
7 lb fat by-product
Steam pressure 25 lb sq in
Approx 25 lb fat
Render suet and flares
Separate
38 lb grd
38 lb cvs
Surplus re-sold as by-product
Dough mixes 5 mixes
DEHYDRATION LINE
Yield
1282 meat bars overwrapped and packed in bulk containers
2½ oz meat blocks 47 x 55 x 25 mm
Vac-pac 2 blocks per bar in foil/film laminated pouches
2½ oz portions
Press 10 sec at 1000 lb/sq in
Refrigerate to -5°C (23°F)
Weigh out
Nitrogen
Gas pack
Pack in cans 405 lb meat bar mixture
Blend to meat bar formular 4 mixes
200 lb dehydrated beef
200 lb dehydrated pork
2 lb monosodium glutamate
3 lb salt
200 lb standard dehydrated minced beef or pork
MEAT BAR LINE



CONVENTIONAL DAIRY EQUIPMENT is employed in this modern soft-serve mix plant. Vacuum pan (rear) processes high quality milk into mixes, which are then pasteurized in vats (foreground).—Dairy Queen Products, Inc., Decatur, Ga.



MIXES are quickly cooled to below 40F., then stored in 3,000-gal. cold wall tanks (foreground).

Tips on successful processing of

Soft-Serve Frozen Product Mixes

Freezer design, legal angles, method of serving, fluctuation in sales load—all pose problems new to the ice cream mix makers. Here are ways to solve them

JOHN J. SHEURING
Professor of Dairying,
University of Georgia, Athens

HOW CAN YOU ASSURE most efficient and profitable preparation of the highly popular soft-serve frozen product mixes?

—You can do it by precise care in selecting ingredients, watchfulness in assembling and blending them according to a suitable formula based on legal standards and freezing requirements, and attention to proper processing.

But the problems involved are very different from those encountered in the manufacture of regular ice cream mixes.

Most troublesome of these results from the differences in freezing procedures.

For the retail stores, manufacturers developed freezers that would dispense a semi-frozen product continuously at an automatically controlled temperature—a most important contribution to the growth of the business.

The resulting product is of low overrun, smooth, firm, and has an excellent body and texture.

Freezers may be operated at full capacity during peak periods of demand and then remain idle for an hour or more. During the latter period, they will automatically cycle on and off to keep the product cold and properly whipped. It is this cycling that has posed one of the most exasperating problems involved in formulating mixes to meet the demand of store operators.

There are many different designs of freezers on the market. They have different types of dashers which operate at various speeds. As a result, mixes that freeze successfully in one unit may not be acceptable for use in another type.*

Formulating the Mix

Preparing a mix that can be used successfully in the soft-serve business involves problems that are very different from those encountered in the manufacture of regular ice cream mixes.

Other than costs, factors that must be considered are legal standards, types of freezers, milk products available, delivery, and storage. Others include the particular problems of proper whipping and firm-

* Some major freezer manufacturers are The General Equipment Co., Indianapolis; The Sweden Freezer Co., Seattle; and the Cherry-Burrell Corp., Chicago.

ness of body that apply especially to these products.

Most important single factor determining minimum ingredient composition is the matter of legal standards that must be complied with in any particular marketing area. Details of these requirements can be obtained from local regulatory organizations that have charge of composition standards for the dairy field, generally the departments of health or agriculture.

Numerous formulas have proved successful for manufacturing soft-serve mixes. It is impossible to detail all of them here. But the following exemplify those that have been commercially satisfactory from a composition basis:

Low-Fat Mix

4-6% milk fat
11-13% milk solids-not-fat
13-15% sugar (sucrose)
0.2-0.4% stabilizer
0.1-0.2% emulsifier

High Fat Mix

10% milk fat
10% milk solids-not-fat
13-13.5% sucrose
0.20-0.40% stabilizer
0.10-0.20% emulsifier

Exact amounts of milk and non-milk products will depend on ingredients that are available. Therefore, formulas are given on a percentage of ingredient basis. If exact formulas, on pounds of ingredients basis, are desired, the author will be glad to calculate them if the inquirer will submit information concerning composition of ingredients (especially milk products) that he has available.

Sources of Fat and Serum Solids

Milk fat will give the product a rich, desirable flavor, if it is secured from high quality sources. Sweet cream is best source and usually can be purchased quite economically, especially during the summer months when this type of business flourishes. However, it is important that the cream be fresh and free of any objectionable flavors.

Frozen cream and sweetened condensed whole milk can be used successfully in supplying milk fat, especially during the period of the year when fresh cream is not available. Fresh milk products, properly processed and stored, are important if a good flavored mix is going to result when the above sources are used.

Fresh whole milk is also an excellent source of fat and serum solids. One of the most modern soft-serve mix plants in the country makes virtually all of its products from fresh, Grade A whole milk. The milk is received in tank trucks and condensed in a vacuum pan to make a superior quality mix.

Unsalted, sweet cream butter that scores 92 or more can be used as a fat source if necessary. However, due to the particular type of whipping and churning that occurs in soft-serve freezers, some difficulties may be experienced with those related problems when butter is used.

Milk fat does not increase the whipping ability of a mix. On the contrary, it tends to retard that phenomenon. If the fat content is too low—less than 4%—the soft-serve may have a tendency to be coarse, weak, and icy. If the fat content is too high—above 12%—the product will be too rich and may be objectionable to many consumers. Since milk fat is the most expensive ingredient, the amount used will definitely affect the cost of the mix.

Serum solids or milk solids-not-fat are all of the solids in the mix other than sugar, fat, stabilizer, flavoring, and emulsifier. They are highly nutritious and serve the important function of improving firmness and body.

Most soft-serve mixes will require addition of serum solids in a concentrated form. Probably, the most satisfactory source is condensed skim milk. This is made by removing a portion of the water from the original skim by heating it in a partial vacuum. The product is usually available, economical, and easily handled in the mix plant. If made from fresh skim, it will have a fine flavor and impart excellent whipping characteristics to the mix.

Sweetened condensed skim normally contains 40-42% sugar. It is also a satisfactory source of serum solids, especially during periods when fresh skim milk is not available for condensing purposes.

Many brands of non-fat dry milk are also good sources of serum solids. These should be prepared by the spray process and be relatively soluble, free of scorched particles, and possess high flavor.

Other Ingredients

Amount of sugar that is used will be determined to a great extent by consumer acceptance. Usually 13-

How They Have Grown . . . Legal Status

Tremendous growth of soft-serve frozen dairy products has been one of the major developments of the past decade.

Their large sales volume represents both new business for the dairy field and a new market for the dairy farmer.

Best estimates indicate that at least 10,000 soft-serve stores are in operation, dispensing more than $400,000,000 worth of product annually in the form of malted milks, shakes, cones, banana splits, sundaes, and bulk.

Basically, they have grown because they bring to the people fine dairy products served rapidly, efficiently, attractively, and at reasonable prices.

Legally, soft-serves aren't covered in most state standards and regulations. In general, this term is now more or less accepted to mean a semi-frozen dairy food that is dispensed directly from the freezer.

Commonly, it contains less milk fat than is required to meet minimum standards for ice cream—usually only from 2 to 8%—and so is classified technically as ice milk.

However, some states require that this product must meet minimum composition standards specified for ice cream. In these cases, it is rightfully classified as soft ice cream.

15% sucrose is sufficient, but in some areas more or less may be required.

If corn sugar (dextrose) is used, amount should be limited to 25-30% of sugar solids, otherwise the mix will have a lower freezing point than desirable, tending to cause the product to be soft and wet. If this sugar is used, the freezer will have to be readjusted in order to maintain a lower temperature. Corn syrup solids, cane syrup, and corn syrup have been used successfully by some mix manufacturers to replace part of the sucrose—usually about one-third of the sugar solids.

There are more than 100 different stabilizers and stabilizer-emulsifier combinations on the market. Basically, most of them are formulated from mixtures of gelatin, sodium alginate, sodium carboxymethylcellulose, locust bean gum, Irish Moss, mono- and diglycerides of vegetable and animal fats and certain basic emulsifiers that have been used in ice cream.

Stabilizers function to improve body and texture of the product by absorbing much of the free water, thus causing smaller ice crystals to be formed during freezing. These smaller crystals aid in giving the soft-serve more stability, smoothness, and firmness.

Emulsifiers are used to improve the whipping qualities of a mix, and they have desirable characteristics in giving smoothness to the soft frozen product. Any reliable stabilizer-emulsifier manufacturer will gladly supply necessary data for the most efficient utilization of his particular product.

Preparing the Mix

After the manufacturer knows the products he has available, the next step is to formulate a mix that will supply the necessary balance of milk fat, serum solids, sugar, stabilizer, and emulsifier to give him the type of mix he wants and which will meet any legal standards for his particular area.

One of the biggest errors made by some manufacturers is their failure to test and weigh properly the milk ingredients that they intend to use. Too many times, they formulate their mixes more or less by guess work.

Accurate weighing and testing is essential if the mix is to be of the correct composition, contain the proper balance of ingredients, and reduce costs. Wasting milk products is costly and foolish.

After ingredients are properly assembled, they should be thoroughly blended in a regular mixing vat. Special care should be taken to follow the manufacturers' recommendations concerning the right use of stabilizers.

There will be serious defects in the body, texture, and whipping characteristics of soft-serve, unless the exact amounts of stabilizers and emulsifiers are used according to directions of manufacturers.

Pasteurizing and Homogenizing

Mixes should be pasteurized by either the holding or high-temperature short-time methods. If the holding or vat method is used, a temperature of 143F. for a minimum of 30 min. should be employed. If the HTST method is used, a temperature of 165F. for 15-20 sec. is recommended.

Long holding periods at high temperatures should be avoided because of the cooked flavor that will result in the mix. And, minimum temperatures and holding times, as recommended in most health ordinances, should be met, thus adequately safeguarding the public health.

Purpose of pasteurization is to destroy all pathogenic or disease-causing bacteria. A secondary advantage of correct pasteurization is the destruction of any enzymes that might develop unfavorable flavors—for example, the rancid flavor caused by the enzyme lipase.

High pasteurizing temperatures also aid in solution of mix-ingredients and are essential for maximum effect of some stabilizers. However, excessive temperatures may destroy the stabilizing characteristics of some products.

Soft-serve mixes must be homogenized. This is important in insuring uniformity, aiding in digestibility of the milk ingredients, and preventing churning during the freezing process.

They should be homogenized at pressures ranging from 1,500 to 2,000 psi., using a single stage. If a 2-stage homogenizer is used, 2,500 psi. on the first stage and 500 psi. on the second, at pasteurization temperatures, are normally sufficient.

The important point is that *all* of the mix should be homogenized, including the first and last portions through the machine. Otherwise, it will churn in the freezer and cause the product to have a grainy body and texture.

Rapid cooling to below 40F., using modern dairy equipment should follow homogenizing. Proper cooling will help prevent bacterial growth, as well as improve body of the product.

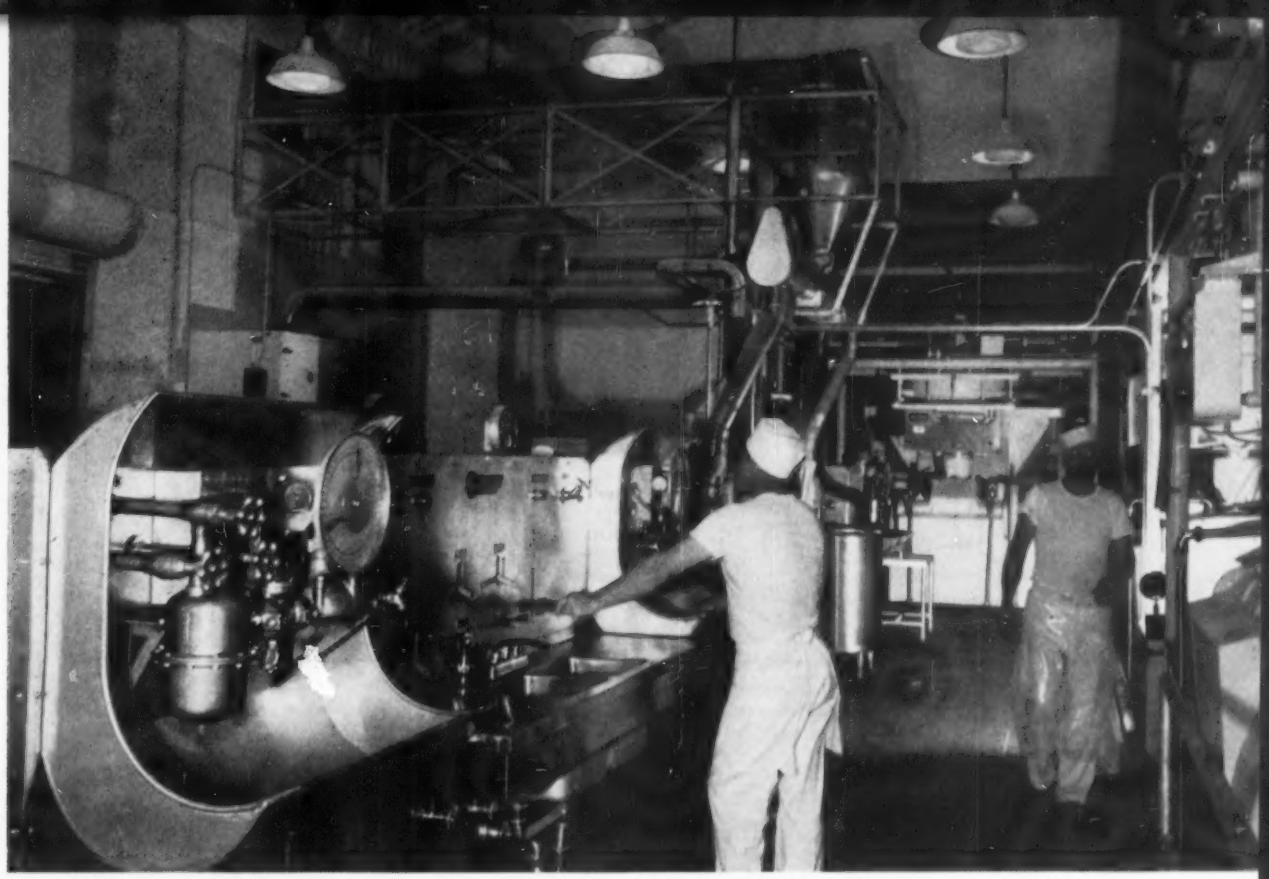
Mix should be stored at temperatures below 40F. until ready for freezing. Bacteria multiply at higher temperatures, causing spoilage and off-flavors. Therefore, correct storage temperatures *all of the time* are essential. Mix can be stored either in well-tinned milk cans, stainless steel containers, or storage tanks. The essential point is that the containers must be clean and the temperatures of storage kept low.

Some of the most modern retail stores have installed mechanically refrigerated farm tanks for storage purposes. Tanks are connected directly to the freezers by the use of vinyl plastic tubing. This arrangement insures maximum protection from outside contamination and eliminates much of the manual labor required in handling cans.

All equipment used in processing.

(*Turn to page* 159)

TANKER is used to distribute mix from processing plant to stores. Here mix is pumped to farm tanks (connected to freezers) for easy transfer as needed.



AUTOMATIC PROPORTIONING of ingredients is first step. Liquids are metered (foreground) to dough mixers. Salt and dry milk are handled in scale system (left rear). Raised platform simplifies visible inspection of mixers.

Engineering Reaches New High In This Ultra-Modern Bakery

Among its many notable "firsts" are the outstanding conveying systems that automate materials handling, and instrument-controlled proofers that up product quality . . . One-story structure features unobstructed work areas

S. E. PRESCOTT and C. R. HAVIGHORST

Respectively, Chief Engineer, Langendorf United Bakeries, Inc., Headquarters, San Francisco, and Senior Associate Editor, "Food Engineering"

NEWEST EQUIPMENT and top-flight engineering team up in making the new $2½-million plant of Langendorf United Bakeries, Inc., Los Angeles, almost completely automatic.

From feed-in of raw materials to handling of finished products, push-buttons and robot electro-mechanical devices control operations, temperatures, humidities, and times to provide an uninterrupted flow of bread and rolls to wrappers.

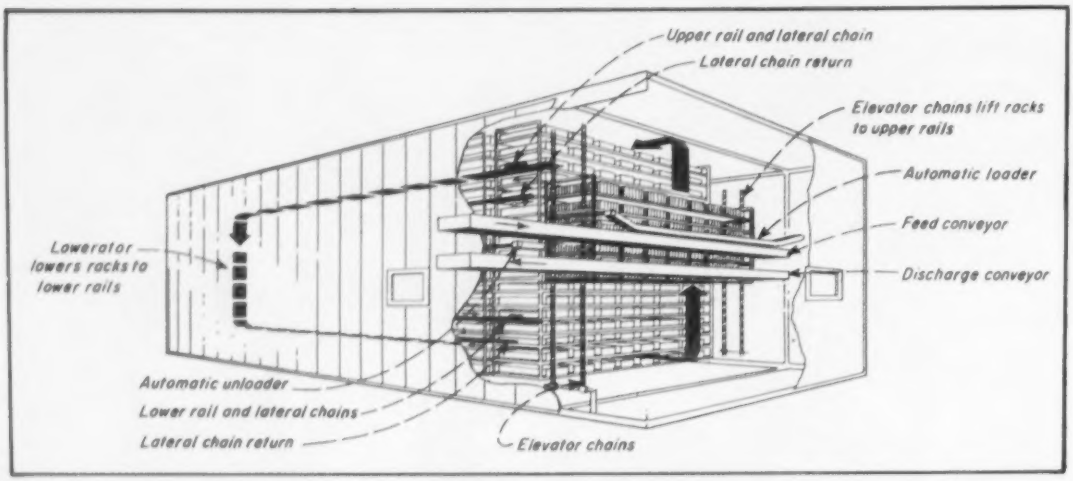
And the building, with its pre-stressed, folded-plate roof spanning large bays without supporting columns, is of most advanced engineering design.

The plant has a rated hourly capacity of 10,000 lb. of bread and 14,400 rolls. Its high degree of mechanization has increased man-hour production rates about 30% over that of the company's previous smaller and older bakery.

INGREDIENT HANDLING

The elevated bread and roll mixing platform is a model of efficiency and sanitation.

These two new automatic proofers up



IN BAKER PERKINS PROOFER, rack travel is indicated by arrows. Pan straps enter on feed conveyor, which groups and loads them onto racks. Elevator then indexes racks for loading-unloading operation. Finally, unloader (which operates simultaneously with loader) scoops straps from racks and transfers them to discharge conveyor.

To eliminate the usual maze of overhead piping and its attendant cleaning problems, lines for all liquid ingredients are underground. Only dry ingredient lines are elevated to facilitate weighing.

Refrigeration compressors and water chilling units are in the subbasement, below this platform. Short runs of insulated piping lead from here directly to ingredient and refrigerated dough mixers. Motors which power the dough mixers are also easily accessible in this basement for adjustment and repairs.

Liquid sugar, liquid shortening, and water are proportioned automatically at the control panels on the mixing platform. The baker merely sets the desired quantity on a meter and presses a button, then the proper amount is delivered to the selected mixer. Operations of the Yeast-O-Lator and ingredient mixers are controlled also from this panel.

The several varieties of flour used are pneumatically conveyed to the scales above each dough mixer. Selection of flour variety and delivery to proper mixer is also a pushbutton operation. When weight demand of the manually set scale has been satisfied, and the flour dumped into the mixer, valve in pneumatic line to this scale is automatically closed. Blowers continue to operate and return any flour remaining in the system to its respective bin.

Dried milk and salt are automatically available, from supply bins located outside the mixing area, through a newly designed system. Each bin has a vertical screw conveyor that connects with an overhead horizontal screw leading to the scale hopper.

As with flour, the baker merely sets desired weight on scale balance and touches a button, then this amount is delivered to the ingredient mixer. A visible, over-under weight scale permits him to double-check on accuracy of the delivery.

IMPROVED FERMENTATION

Dough mixers, which are jacketed to accommodate refrigeration coils, and their accessories, are the modern, yet conventional, equipment. However, the semi-automatic type of fermentation rooms are not in common use.

These rooms are equipped with air conditioning systems (Union Steel Products' Union-Aire) controlled by pneumatic, recording instruments that regulate temperature and humidity. Troughs move in a procession down the feed side, laterally across the end of the room, then back to the discharge door. A carriage, powered by a hydraulic ram, moves incoming troughs forward on their own casters and between two side guides.

YOU'LL FIND a diagrammatic presentation of this new facility in this month's 4-page foldout flowsheet, "Pace-Setting Bakery Lines," on p. 104-107.

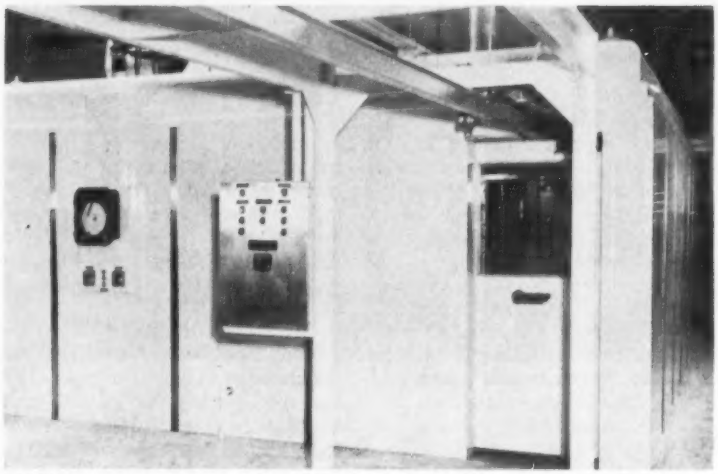
To be operative, the room must be completely filled with 32 jumbo (12 ft. long) troughs. Upon reaching end of room, the hydraulic-motor-powered cross-carriage moves end trough transversly and positions it in the discharge line. At this point, another carriage, identical with the feed unit, moves the procession toward the discharge door.

Normally, the cycle requires about 4½ hr. A warning light, atop the room, flashes to indicate when fermentation cycle is completed and when a trough is to be discharged and another loaded. The operator simply wheels one to the feed door and moves it in. At the same time he opens the discharge door, and one is ejected.

Because of the relatively small size of the feed hopper, dough previously had to be loaded manually into the Pan-O-Mat roll molder and panner. The new troughs eliminate this manhandling job. They are constructed with a discharge aperture equipped with a rack-and-pinion gate. This is located in center of trough bottom.

Troughs are now elevated, by pushbutton, to a point directly above the feed hopper. The operator opens the valve and the dough drops gently into the hopper. The valve may be

baking efficiency, improve quality



MONORAIL rack-type proofer (Ferry Steel Products) is integral part of highly mechanized roll line. It has an air conditioning system utilizing steam to develop required humidity. Residence capacity: 30 racks.

adjusted to control the amount of dough being discharged so as to not overflow the hopper, yet provide a constant supply.

2 NEW AUTOMATIC PROOFERS

The final proofer in the bread line is an outstanding advance in bakery engineering. One of the first three to be installed commercially, this Baker Perkins automatic rack-type unit has demonstrated its ability to contribute to the production of a more uniform, better quality loaf.

The proofer is entirely inclosed, and its interior is constructed of stainless steel. It has its own air conditioning system (controlled by an automatic recording instrument) which provides ideal atmospheric conditions to fully develop the volume and cell structure of the loaf. Proof time, too, is automatically controlled.

Unit has eight principal parts comprising feed, grouping, and discharge conveyors, automatic loader, unloader, elevator, Lowerator, and double-deck rails upon which racks are conveyed by hollow-stud roller chains.

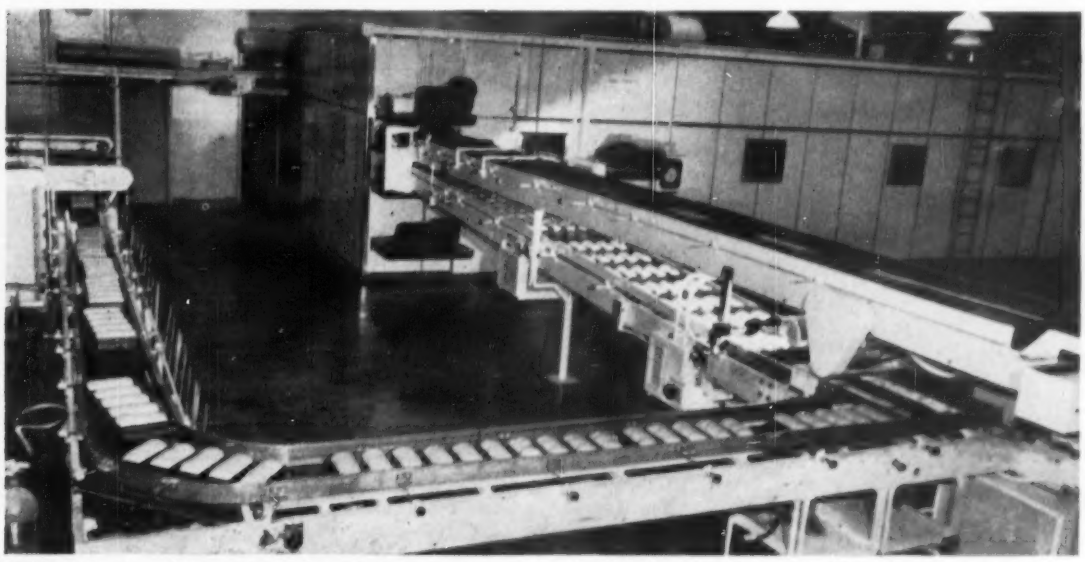
There are 29 racks, each equipped with trucks that roll along the rails. Racks have seven shelves, each holding eight 1½ lb.-pan straps (5 pans each). Total number of loaves in residence at one time is 8120.

There are four endless conveyor chains, powered by sprockets at the termini of each of the four rails. Dogs, spaced at uniform intervals, engage slots on both sides of the racks, and move them laterally on the upper rails, then transfer them to the Lowerator at back end of proofer.

To maintain alignment and spacing, Lowerator engages slots at sides of each rack and moves it to the lower rail, where the slots are engaged by dogs on the conveyor chains.

The Lowerator and elevator are comprised of a set of two endless chains powered by sprockets. These operate in the vertical plane and are located on both sides and at the ends of the two sets of rails. Each set of chains is equipped with short lengths of rail, properly spaced to accommodate the racks' trucks.

The elevator is more complex in its operation than the Lowerator, inasmuch as it must index the shelves at proper intervals, level with



STRAPS (5 pans each) move into BP proofer on upper conveyor, and are discharged on lower one. Then they are separated (by faster conveyor foreground) and proceed single file to automatic oven (left).

shelves at proper intervals, level with both the feed and discharge conveyors.

Operation of Elevator

To describe its operation, let's assume that the seven shelves of a rack have been completely charged with pans of dough to be proofed. As it leaves loading-unloading point (front of unit), rack is elevated to the upper rail, where the horizontal chains engage and move it from the elevator onto the rail. Simultaneously, another rack from the lower rail is being indexed to the first load-unload position.

Feed conveyor (which also serves as a pan grouping belt) and discharge conveyor are separated by a space exactly equal to that between two shelves in a rack. Loader and unloader consist of two steel pusher bars, mounted at each end of heavy steel rods. Former is located directly above latter. Moving in the horizontal plane, these simultaneously sweep straps off the feed conveyor onto a shelf and off a shelf onto the discharge conveyor.

The elevator indexes a rack in eight positions as it moves upward. At each position it pauses for sufficient time for the loader-unloader operation. When loaded, it is moved swiftly to the upper rail and joins the procession of racks moving through the system.

Only manual attention required is setting the proof time, temperature, and humidity on a central panel. Remote control provides convenient adjustment for desired proof times. Interlocks (in the electro-mechanical circuit) stop the proofer unless each mechanical function is completed in proper sequence. Other safety devices prevent damage and notify an operator should a pan-strap become misaligned.

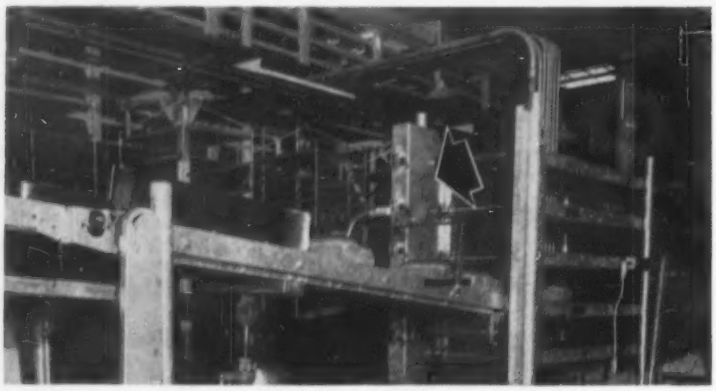
Straps are discharged from the proofer in a lateral position across the conveyor in groups of eight. This conveyor is comprised of two belts operating at different speeds in order to space the straps before they are transferred to the single-line oven-feed conveyor. Four straps are automatically loaded lengthwise onto the oven's traveling-hearth.

New Roll Proofer

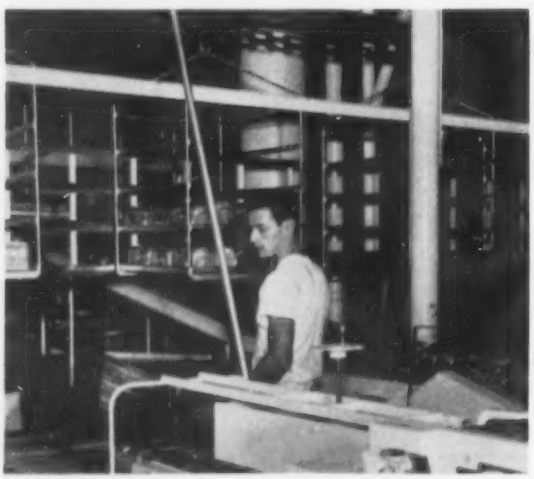
Controlled by two panel boards, one at the feed and the other at the discharge side, the new Ferry Steel Products Mono-Matic proofer for rolls is entirely automatic in operation. Its residence capacity is 30 racks, each having 15 shelves. These are removable so that space may be made available for proofing bread if desired.

The unit has its own air conditioning system and blowers, utilizing steam to develop required humidity.

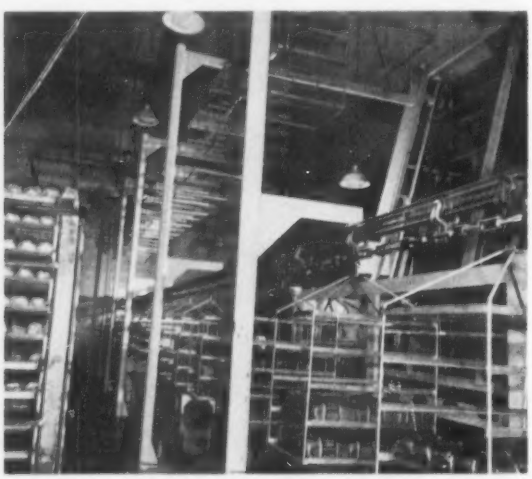
Materials Handling Advances



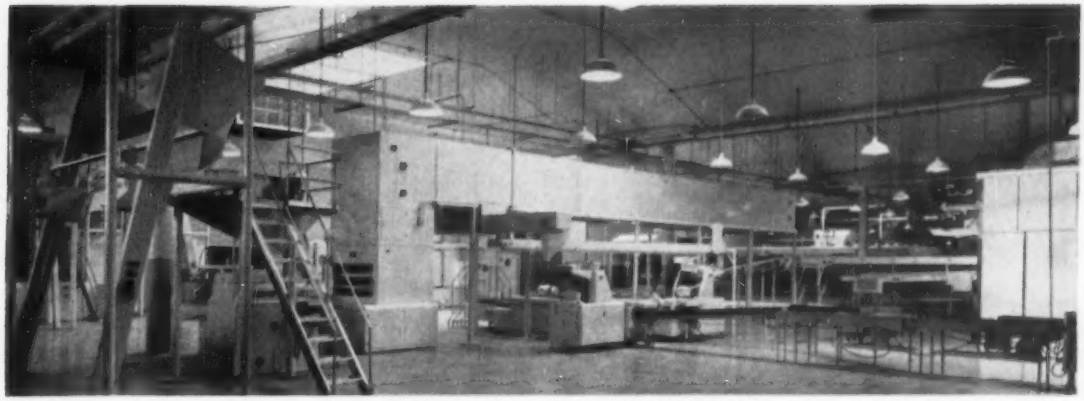
PUSHBUTTON boom-type selector (arrow) feeds loaves from single conveyor to five others that serve slicer-wrapper units. Note monorail and carriages (top) on which wrapped loaves are transported.



AS BREAD IS DISCHARGED from wrapper, operator transfers it to wire trays stacked in front of him. When one is filled, he slides it onto carriage (rear) as it moves past on monorail (top).



AT UNLOADING STATION carriages move at floor level to enable easy transfer of trays to racks used for transport to sub-stations. Empty carriages return on high monorail (top), which moves them above equipment.



ROOF is of pre-stressed, folded-plate, thin-concrete slabs. Design provides large working areas unobstructed by supporting columns. Skylights, glazed with heat-resistant glass, afford daylight illumination.

Temperature and humidity are automatically controlled. The vertical air-ducts form supporting columns for its roof. These connect with horizontal, cylindrical ducts having perforations that jet the air into the room. Return ducts are in the ceiling. With the exception of the racks, this proofer consists of six major parts: Loading conveyor, unloading conveyor, turntables (6 sets of 2 each), duo-rails (3 sets), transfer conveyors (3), and indexing bars (3 sets).

How It Operates

Only one rack at a time may be loaded into the proofer. And unloading cannot be done simultaneously with loading. If, during the time of loading, the unloading button is pressed, a time relay switch stores the signal at the "waiting circuit" until the loading action is concluded. Then the unloading will take place without need to press the button again.

Feed and discharge doors remain closed to facilitate air conditioning control. Only one of these may be opened at a time by the pushbutton controls.

Loading begins at Row 1, and proceeds to Rows 2 and 3. Operator selects desired row at switches on control panel. He then pushes the loaded rack against the rack-stop at entrance of proofer and presses "load" button.

Simultaneously, rack-stop is released, entrance door opens, and loading conveyor moves out and engages the rack. This conveyor arm is powered by a hydraulic ram. It is equipped with dogs that engage bars on top of racks. In one cycle it moves a rack into position on the two turntables of Row 1. As it automatcially recycles, it moves racks to positions before Row 2 or Row 3.

When loading conveyor stops, the electro-mechanical system rotates the six turntables in a 90 deg. arc, connecting the monorail with the duo-rail. Movement of these turntables trips the switch that operates the hydraulic transfer conveyor on this particular duo-rail.

Actually, there are four rails in each of the three rack lanes. The monorail trucks roll on two of these. The other two support the rollers of the indexing bars.

These bars are equipped with dogs, separated at intervals the width of a rack. In initial operation, the hydraulic ram moves the two indexing bars, in unison, across the top of the rack, which has been positioned on the turntables. The dogs engage it and draw it into the first rack position on the duo-rails.

Succeeding racks being loaded in this lane are similarly engaged, as are racks already in the lane. Thus, each rack is moved gently forward until the lane is filled.

When proofing cycle is completed, unloading operator turns selector switch to desired row, then presses unload button. He starts with Row 1, then proceeds to unload the other two in sequence.

The indexing bars deliver a rack to the turntables, which then move 90 deg. to place trucks back on a monorail. Unloading conveyor is identical to loading one except that its dogs engage the rack and move it out the exit door.

As the unloading conveyor stops cycling, it trips a limit switch that closes the door and resets the system for the next load or unload operation. These two doors may be operated by a toggle switch whenever an operator wants to enter the proofer.

MATERIALS HANDLING

From the section of the monorail used for rack storage, the operator has but to push a button to release the stop at this point, then an empty rack rolls by gravity to the roll loading station. After loading it, the operator pushes it to the monorail stop, directly in front of the proofer.

Upon leaving the proofer, the monorail moves racks closely adjacent to the roll oven to facilitate unloading of proofed rolls and, at the same time, loading of baked ones. Loaded racks move by gravity to an automatic switch, located at the entrance of the roll cooler, which alternately feeds them onto one of two monorails running through it.

This monorail system (total length 504 ft.) is equipped with every possible labor saving device. And these are designed to be foolproof.

At exit end of cooler, the two monorails converge into an inclined rail on which the racks roll toward the unloading point at the roll slicer conveyor.

An ingenious rack stop is the major part of this automatic system. It is comprised of two elements.

On the right front top of each rack is a lever fixed to the rack by an axle. The part of this lever extending beyond front of rack is inclined and is equipped with a 4-in. wide by 3-in. dia. roller.

The part of the lever on the other

(*Turn to page 174*)

EXTRACT-FILLING DEPARTMENT combines good overall lighting, functional use of color, attractive flooring, air conditioning (note exhaust ducts), and an acoustical ceiling. Recessed fluorescents and glass-block wall area provide uniform illumination. The easily cleaned floor is of blue and white vinyl tile. Walls and columns are painted a light buff; dado and equipment, a light gray; and ceiling, a flat white.

MODERNIZED LIGHTING

Affords Multiple Benefits

- Sharpens Q. C.
- Ups Production
- Cuts cleaning costs
- Eases maintenance

LEONARD TRAUBERMAN
Assistant Editor, "Food Engineering"

ADVANCED FLUORESCENT LIGHTING that makes work areas both attractive and safe plays a key role in boosting employee morale at McCormick & Co., Baltimore.

Actually, it's an important phase of the company's overall employee-comfort program, a notable example of which is the recent floor-to-ceiling revamping of their separate extract- and spice-filling departments.

Although improved lighting was a prime target, these rooms were further provided with: Attractive floors of vinyl-composition tile; a functional color scheme for walls, columns, and packaging equipment; comfort air conditioning; and acoustical ceilings.

Difficult as it is to evaluate the effect of these innovations on employee morale and efficiency, McCormick feels that they have sharpened quality control and upped productivity. In addition, the remodeled areas are now easier and less costly to clean and maintain.

A large share of the benefits is attributed to the departments' new lighting systems, each designed for top seeing comfort and economically maintained by group relamping. For efficient utilization of light, ceilings were painted a flat white; walls and columns, a light buff; and dado and the various machine surfaces, a light gray.

Recessed fixtures were chosen for the dropped ceiling in the extract-filling department (lead photo), while suspended units were used in the spice-filling

(*Turn to page 210*)

SUSPENDED FLUORESCENTS in spice-filling area supply proper distribution of direct and ceiling illumination to eliminate shadows and glare.

Downs Cleaning Time With Pressure Gun

Minute Maid's no-steam washup tool saves 36% on equipment cleanup hours, and does a better job. Centralized detergent mixing station couples to plant-wide piping and outlets to put cleaning solution right where it's needed

D. I. MURDOCK and C. H. BROKAW
Quality Control Department, Minute Maid Corp., Orlando, Fla.

ADOPTION of a high-pressure spray rig for cleaning process equipment has won substantial savings in washup time, here at Minute Maid.

The technique employs a light, compact gun—actually developed for spraying insecticide in citrus groves—and a centralized mixing station for a detergent solution, with pipe lines radiating to convenient outlets in the plant.

With this setup replacing the conventional steam-gun and hand-scrubbing methods, we have attacked the time-consuming job of washing our juice extractors, finishers, evaporators, and other hard-to-clean units—with these six benefits:

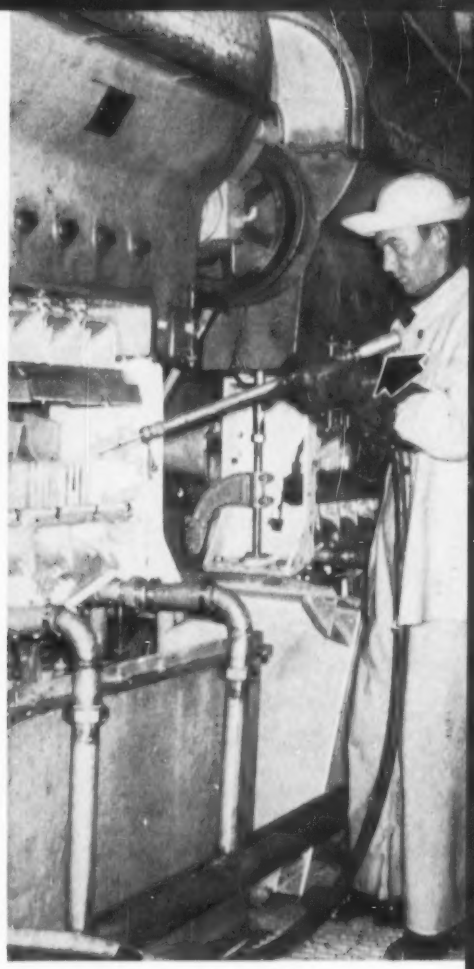
1. **The new method shortens washup time on extractors by 36%.**
2. **It is safe. We now have no burns, such as used to occur with the steam guns.**
3. **It reduces humidity—and resulting mold growth—because no steam is used.**
4. **Gives a more thorough cleanup than the old methods, and readily removes food material from cracks and crevices.**
5. **Provides the right kind of spray needed for each cleanup step by a simple twist of the spray-gun handle.**
6. **Makes cleaning simpler. There are no clouds of steam to obscure machines—no hand work needed to finish the job.**

Analyzes Cleaning Methods

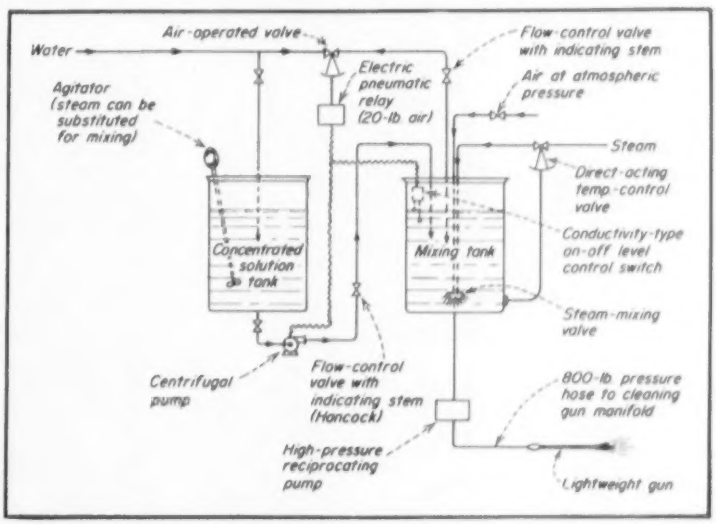
Key point that started us on development of a better cleaning system was the amount of production time we lost when the plant was shut down for cleanup.

This washup operation, which must be repeated two or more times a week, took about four hours. And the steam guns and fiber brushes we were using were not efficient, according to our time survey. Brushing is always tedious, and bulky steam guns tend to bake citrus solids on the surfaces being cleaned.

Searching for a better way, we ob-



PINPOINT OR WIDE ANGLE spray is secured by twisting handle (arrow) on this light, high-pressure cleaning gun. Hose connects to convenient outlet that supplies detergent from central station.



OVERALL DIAGRAM of system shows arrangement of control and detergent lines. Minute Maid's outlay was $2,000 to build it. Note to other processors: Concentrate tank should hold enough detergent for one or more cleanings. Mixing tank need only be large enough for adequate mixing (200-500 gal.).

tained a portable, insecticide spray rig, consisting of an adjustable spray gun (Gun Jet, Spraying Systems Co.), a pumping unit (Model 33K, FMC, John Bean Div.), and a 55-gal. drum. High pressure hose (800 lb.) was used to connect gun with pump.

This unit shortened cleaning time per extractor from around 15 min. to a fast 9 min.—a total saving, in a plant having 30-extractors, of 2½ hr.

With this success, we decided to build a permanent installation that would give us even greater flexibility.

(Turn to page 143)

• • •

CRATE-CLOSING MACHINE quickly and safely "squares up" ends and sides, folds lid, closes fasteners, and sends closed crate onto conveyor to storage.

IN NON-STOP OPERATION, celery is conveyed from graders and trimmers to these packers, who fill it into wire bound crates according to stalk sizes.

Topflight Handling In Produce Packing

FOR ITS STRAIGHT-LINE materials-handling know-how in fresh-produce packing, Leach Farms, just north of Berlin, Wis., can take a bow.

It's not the size of its specific celery operation. Rather it's the fact that its plant is a modern model—compact, highly mechanized, and top efficient.

So well organized is the handling routine that celery can be washed, inspected, graded, crated, labeled, and placed in cold storage in only 36 min. Product movements are mechanical throughout, with the exception of manual stacking and unstacking in the cold storage room.

The packers call the plant a "shed," but actually it's a modern cement-block structure with latest chutes and conveyors snaking through it from twin wash-tanks at one end to the capacious truck loading dock at the other.

Closeup of Handling

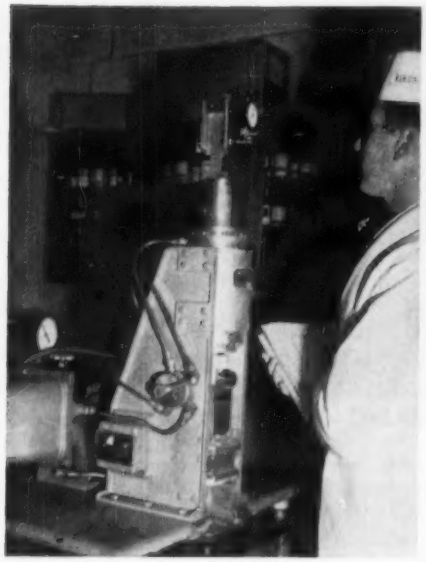
Initially, flat-bed farm trucks speed crates of the field-fresh celery to the wash tanks. At the far end of these tanks, the stalks float onto a slow-moving conveyor. This carrier takes them through final cleansing stages, then past twin lines of graders and trimmers. Next, the packers fill the celery into wire-bound crates, according to stalk size. The crates are supplied from an out-of-the-way balcony via twin angle-iron slide rails (see photo).

Filled crates then move on to a single conveyor feeding a high-speed box-closing machine that requires only a single operation. This machine folds down the lid of the wire-bound crate, engages and closes the wire-loop fasteners, then ejects the closed crate onto a roller conveyor leading directly into the cold storage room. Here, the crate is automatically turned over to another roller carrier running along one wall of the room.

Set here at right angles are six roller conveyors forming a miniature "classification yard" for segregating crates according to size and number of stalks they contain. These classifying carriers slope gently to a roller conveyor running the length of the opposite wall of the storage room.

Crates feed onto the latter conveyor several at a time, to be taken to their proper places in storage. And when ready to be shipped, they're put on a power conveyor feeding directly to the truck door.

Erection of this advanced plant was preceded by study of outstanding operations in other celery areas. Then the final design incorporated the elder Leach's own expert knowledge of straight-line production techniques.



RESEARCH FACTS, revealed by instruments such as this meat tenderometer, are "translated" in the plant into quality-boosting equipment. Employees, too, are made conscious of QC measures through training and a . . .

. . . **DEFECT SCORE BOARD** that dramatizes daily reject percentages on eviscerating and cutting lines. Keen competition holds faults at a low level, even though plant is just getting started.

Really Puts QC On the Line

Control and research—directly applied in handling, processing, and packaging—clinches better frozen poultry and pies . . . And the plant matches product protection with up-to-date speed and efficiency

ROBERT J. KELSEY
Assistant Editor, "Food Engineering"

BIG STRIDES are being made in stricter control of chicken processing and the manufacture of poultry and meat pies. And this advance is particularly evident at Birds Eye's brand new plant in Pocomoke, Md.

For here, quality control has stretched its arm beyond the usual range to actively influence selection of materials handling, processing and packaging techniques.

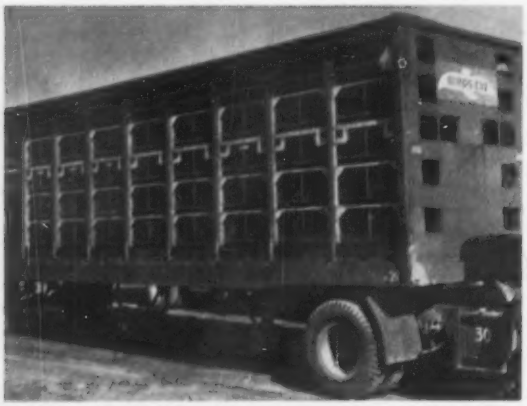
The resultant methods and equipment—whether company-designed, recently marketed, or adapted from other processes—accent top protection of product without sacrificing labor-saving speed and efficiency.

There are two parts to the actual control program: (1) Supervision of picking, eviscerating, and packaging of frozen fryers and parts of birds; and (2) control of pie-packing operations, where turkey, beef, chicken, fruit, and berry pies are processed—some from bulk-frozen ingredients brought in from the company's Waseca, Minn. plant.

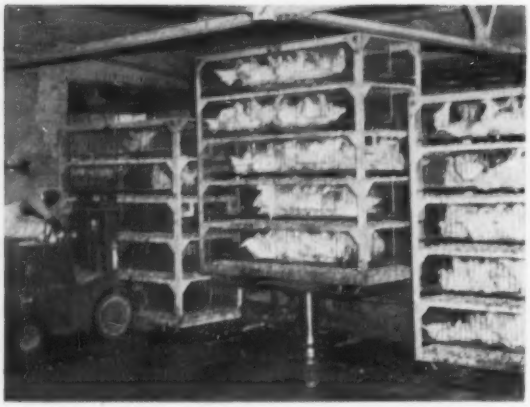
Birds Regimented for Even Weight

On the frozen poultry line, control actually starts with the egg. Production comprises, in part, contract birds that are raised to company specifications by selected growers, who obtain their chicks from company-approved hatcheries. The plant's potential capacity is 450,000 head per week.

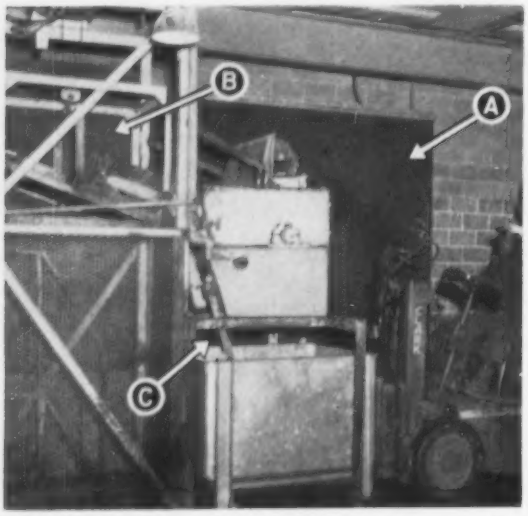
So closely governed are these chickens that their dressed weights all fall within a range of only 2 oz. And even the weights of birds bought on the open mar-



SPECIAL CAGES ("batteries") are used to hold birds between growers and plant. Multi-tier units (designed by company) each hold about 160 chickens. Open-sided semi-trucks speed them to plant where . . .



. . . **HANDLING** of caged fowl is performed solely with lift trucks. Here, batteries are positioned at pinning station on the picking line. Hydraulic lifts (company built) raise cages for easy unloading.



CHILLING BINS receive ice-and-water charge at this unique station. Ice is stored in a surplus insulated truck body (A), mounted on cinder block foundation. Electric, hoist-powered elevator (B) was built by company to raise ice blocks to crusher. Water is added through line (C).

ket are brought into close line by use of a feeding station—a large room just off the process lines. Here they are held up to two days before killing. Constant feeding until 4-8 hr. before killing enables them to regain weight lost in shipping and permits plant men to regulate their final size.

After killing, their subsequent processing is entirely governed by three factors: (1) Scalding time, (2) scalding temperature, and (3) chilling. These three measurements, assert company researchers, directly affect tenderness of chicken. And any variation from optimum time and temperature points—either more or less—produce toughness in the final product.

These facts, determined through exhaustive tests on thousands of birds, have led Birds Eye to revise its chilling procedure, and likewise, to put evisceration after the holding period.

Careful Tests Govern Plant Procedure

Key lab aid in the long-range study is a unique tenderometer, developed by company research men and built by Bridge Food Machinery Co. In a now-standardized test, the unit—a Cramer-type shear press—gages texture of the *pectoralis major* muscle (in the breast).

To perform the test, muscle is stripped from the breast and cooked for 18 min. at 90C. in chicken fat. It is next cooled, weighed, and manually shredded with the grain into ¼-in. strips. These are placed in a slotted chamber and arranged perpendicular to the unit's knives. Tenderness or toughness is measured by the amount of pressure needed to cut the mass. Today, before any change is finally made in processing techniques, this test is run on pilot batches of birds to insure maintenance of standard quality.

On the pie line, close control of dough is a necessity. For unless this ingredient is properly aged and maintained at the correct temperature, it will stick to the equipment.

To avoid this, the company processes the dough in a thermo-controlled room, held at constant temperature. And temperature of the dough on the line is constantly checked to be sure it does not exceed 60-70F.

Viscosity of each tank of gravy is also standardized by the QC department, using a Bostwick Consistometer. The ingredient is likewise taste-tested to insure accurate formulation.

Hourly, pies are drawn from the line and literally taken to pieces to check the relative weights of gravy, dough, and meat, and to get a numerical count on vegetable ingredients. Other samples are removed for taste testing and bacteriological examination.

Process Units for Fryers Stress Cleaning

Several pieces of processing equipment particularly contribute to high quality of frozen fryers and pies.

In preparing fryers, cleanliness of chickens is insured

by a triple picking system. Birds are first hung by the feet and passed through a scalder (Albright). Next, they enter a rougher (Barker), then pass through a center-line finisher. The latter was made by cutting a conventional side-line finisher (Gordon-Johnson) in half and adapting it for this operation.

After two men turn them and hang them by their necks, the birds pass through another rougher and the second half of the divided finisher. Then come conventional inspectors and trimmers, and chickens pass through a final finisher (Barker) that removes any traces of pin feathers and thoroughly cleans the birds before they pass to the chilling tanks.

Evisceration is conducted on two standard lines. But before birds go to packaging, they are passed through special reel washers (designed by Birds Eye) that give the chicken parts an extra-thorough cleansing.

Pie Line Accents Speed

To accelerate manufacture of pies, gravy-making has been put on a continuous basis through the ingenious use of pumps, tanks, and heat exchangers.

Broth and chicken fat are emptied from 30-lb. pails into a steam-jacketed kettle. After heating, liquid is pumped to a second tank, where salt, starch, flour, and spices are added.

Frozen chicken skins are cut into small blocks on a band saw and fed through a comminutor (Fitzpatrick). Part of the flow of broth between the tanks is diverted through this grinder to help wash the skins into the second tank.

After further processing, which includes heating in a tubular exchanger (Walker Wallace), mixture is pumped into agitator-equipped storage tanks where peas and diced carrots (and potatoes for beef pies) are added. Chilled gravy then goes to pie line.

The actual line is a straight-through operation (all Colbourne equipment) with a rated capacity of 60,000 pies per shift. Dough is brought to the head of the line and fed into a former that turns out rolled billets. These bypass the first sheeter and go to a second unit that makes top crusts.

Trimmed dough from the end of the line is returned and fed into the first sheeter for bottom crusts.

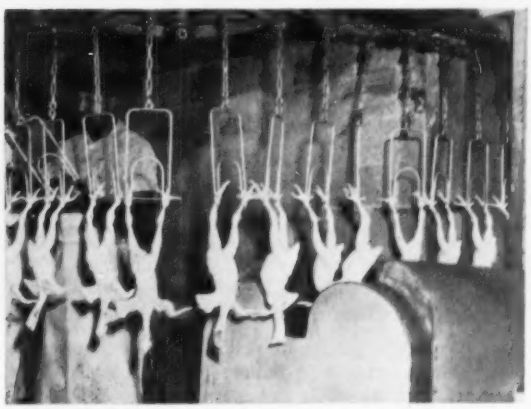
Aluminum pie-cups are automatically fed into belt-mounted molds, and travel the length of the line—receiving bottom crust, gravy, meat, and the top crust in that order.

Pies are automatically crimped, trimmed, and removed from the molds, then pass under a tamper that compresses the raised top crust, and at the same time, stamps a code letter ("C", "T", or "B") into the crust to signify what kind of meat is in the pie.

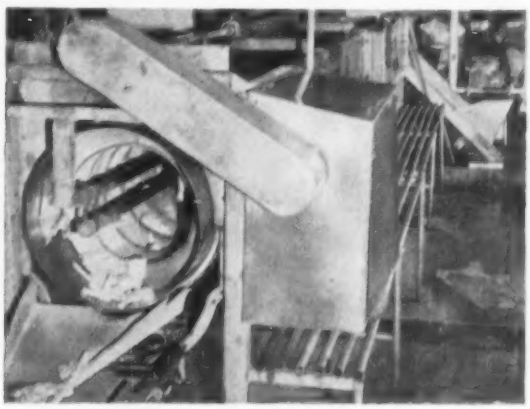
To spark big savings in hand labor, the company has

(Turn to page 205)

ON GRAVY LINE, frozen chicken skins are sawed into chunks, then run through comminutor. Sanitary line meters in gravy to help wash pieces through the machine.



DEFEATHERING is efficiently performed by half of a conventional side-line finisher (right). Birds are then inverted (left) and run through other half of company-converted unit.



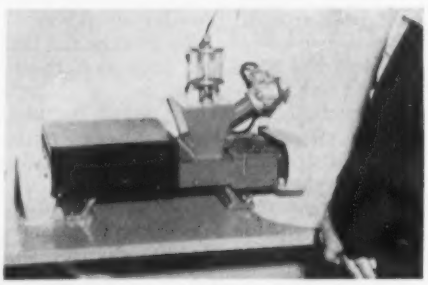
FINAL WASHER for cut-up birds is a company-designed reel unit. Sprays can be regulated in both number and pressure.

18 New Process Controls

Units for regulating and recording flow, feeding, metering, and analyzing viewed at New York show of Instrument Society of America

5 RECORDERS, CONTROLLERS

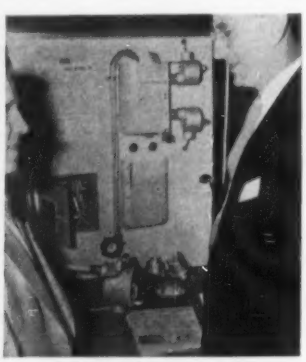
NEW automatic production recording (APR) system that collects, stores, correlates, and records data was demonstrated as it applies to weight variations. Guests were weighed on scale equipped with electrical readout device. Differences between scale weights and guests' estimated weights were computed. Number of guests, their total weight, and elapsed operating time were added and stored in control panel. Finally, above data and time of day were automatically printed on special sheet and recorded on 5-channel tape.—International Business Machines Corp., New York. (56A)



MOISTURE control of free-flowing solids is continuously measured, recorded, and controlled by new Rogers unit. Accuracy of ±0.15-0.20.—Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia 33. (56B)

COMPLETE interchangeability in less than 5 min. is feature of new pneumatic and electrical flow transmitters. Both have same rotameter extension and armature unit.—Brooks Rotameter Co., Lansdale, Pa. (56C)

VISCOMETER automatically measures, records, and controls viscosity of solutions in processing. It comes with pistons suitable for each application.—Norcross Corp., Newton 58, Mass. (56D)

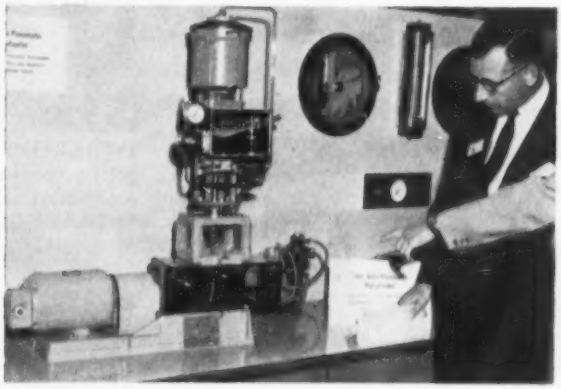


MOTIONLESS electronic level control for granular products operates relays that stop or start feed when level in bin rises or falls below units.—Jarco Services, Inc., Tulsa, Okla. (56E)

4 FEEDERS, 2 BATCHERS

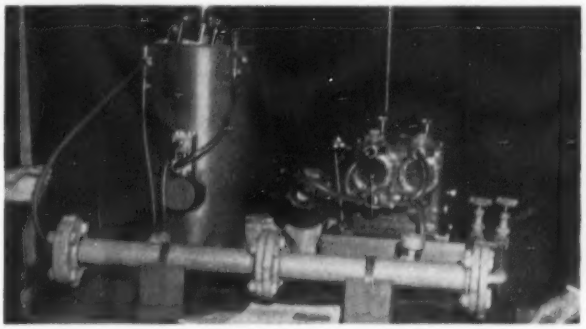
CHLORINATOR for either manual or instrument control delivers 500-2,000 lb. Cl per day. Maintains set feed rate within 4%.—Wallace & Tiernan, Inc., Belleville 9, N. J. (57A)

WEIGH-BATCHER for liquids or solids has colored lights to indicate progress of automatic cycle, pushbuttons to by-pass electronic controls. May be equipped with digital recorders that print weights on tape at scale or remote point.—Howe Scale Co., Rutland, Vt. (57B)

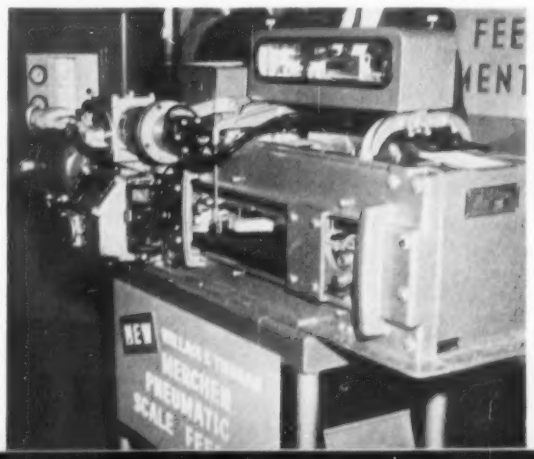


SANITARY diaphragm pump for proportioning liquids and slurries to processing has pneumatic controller that automatically adjusts output to compensate for variable product flow. Delivers up to 340 gph. at 100 psi. Operates at pressures to 3,200 psi.—Lapp Insulator Co., Leroy, N. Y. (57C)

SMALL inexpensive feeder for corrosive materials employs plastic tubing that is alternately squeezed and expanded mechanically.—Brooks Rotameter Co., Lansdale, Pa. (57D)



FLUSH FEEDER for accurate proportioning of concentrated slurries, acids, etc., employs either diaphragm- or plunger-type displacement unit. Provides pressures to 1,700 psig., capacities from 0.2-650 gph.—Proportioneers, Providence, R. I. (57E)

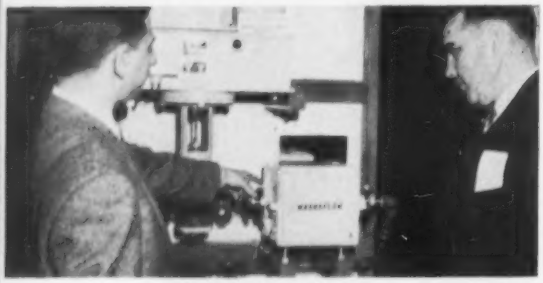


CONTINUOUS weigher controls flow of dry, free-flowing materials in accordance with manually set pneumatic signal, or in proportion to automatic signal from external source. Feed rate is maintained within ±1% over any 1 min. period.—Wallace & Tiernan, Inc., Belleville 9, N. J. (57F)

For detailed data on units circle key number on Readers' Service Card in back of book

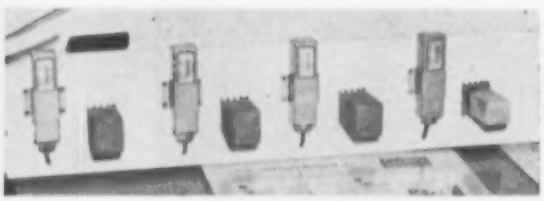
5 METERS, 2 ANALYZERS

GASES and volatile liquids may be analyzed quantitatively and qualitatively by new chromatograph. Uses micro-samples and operates with absorption, gas-liquid partition, and reaction columns.—Consolidated Electrodynamics Corp., Pasadena, Calif. (58A)



SANITATION and precise measurements are features of electromagnetic flowmeter that comprises smooth-bore tube with flush platinum electrodes and exciter magnet.—Nuclear Corp. of America, N. Y. C. (58B)

SPECIFIC GRAVITY, density, and %-solids of flowing liquids are measured continuously by unit employing special cell mounted on side of pipe. Cell measures rays that pass through liquid from radio active source.—Ohmart Corp., Cincinnati 14. (58C)



PROXIMITY SWITCH is for detecting presence of ferrous objects without physical contact, has no moving parts. Objects passing through magnetic field produce signals that flow to switch to operate control relay at up to 10 times per sec.—Doelcam Div., Minneapolis-Honeywell Reg. Co., Boston 35. (58D)

INFRA-RED SPECTROMETER is designed for industrial routine, and process-control functions. It features use of evacuable light path. Assembly is self-contained and portable.—Unicam Instruments, Ltd., Cambridge, England. (58E)

PORTABLE fumigant meter measures continuously mixtures of methyl bromide and air for pest control. Also applicable for combustion and flue gas studies, pre-combustion air-gas mixtures, inert and special atmospheres. Combines 100v., 60c. power supply, sensing element, and flow system. Also furnished with 6v. cells for battery operation.—Gow-Mac Instrument Co., Madison, N. J. (58F)

IDENTIFYING and measuring components in a mixture and determining molecular structures are applications of N-M-R Spectroscopy. By passing material to be processed through a probe attached to a simplified detecting system, control signals are instantly flashed.—Varian Assoc., Palo Alto, Calif. (58G)

New research facts on —

How Foods Weather A-Bombing

McGraw-Hill Washington News Bureau

Products in tin, plastic, paper, textile, and glass containers—exposed to an atomic blast—suffered little irradiation, vitamin loss, or changes in flavor and texture. And even physical damage could have been minimized by proper commercial storage

Food supplies and their packages will survive an atom bomb blast in far better shape than man, himself. Such is the conclusion of a now-released report on Operation Teapot—the cooperative nuclear bomb test, run by the Atomic Energy Commission at its Nevada test site with the help of several Federal agencies and food industry groups in the Spring of 1955 (see FE Mar. '55, p. 197; May, p. 208; and June, p. 216).

The 15,000 tons of food, exposed to nuclear explosion, have been exhaustively studied by Government scientists and researchers from National Canners Assn., Can Manufacturers Institute, and Glass Container Manufacturers Institute. These men searched for a variety of effects—physical damage, harmful irradiation, vitamin loss, and texture and flavor changes.

The findings: Physical damage was about what was expected under such heavy blast pressures, but irradiation was a good deal less than anticipated. Scarcely any foods were rendered completely unsafe for human consumption. Similarly, vitamin losses and other chemical changes were only minor.

Before the test, over 100 kinds of fresh and processed foods in many types of containers were placed in and near the calculated area of "total physical destruction". Some of the conditions simulated normal commercial practices.

Most of the food, however, was placed in shallow, thinly covered slit trenches, located ¼-½ mile from ground zero. Previous blasts had shown that neither man nor buildings (except steel or heavily reinforced steel and concrete structures) could survive so powerful an explosion within that area.

The 1955 blast—rated at 30 to 35 kilotons—generated an atmospheric pressure of 50 psi. (measured ½ mile away). To appreciate the power of this blow, it should be noted that a man would be knocked flat on his back by a sudden burst of pressure measuring only 1 psi.

Packaged foods, stored in blockhouses and other above-ground structures a mile or more from the blast, suffered some physical damage, but absorbed no measurable amounts of radioactivity.

Above-Ground Foods Gaged

Significantly, the physical damage encountered at the above-ground storage sites is clearly avoidable. And damage prevention lessons learned from the Nevada test can be constructively employed in commercial warehouses to minimize losses, not only from an atom bomb blast, but from industrial explosions (such as the Texas City catastrophe) and natural disasters (as hurricanes).

Most of the physical damage was due to displacement. The blast dumped food off shelves—resulting in breakage, denting and crushing. But this occurred only when foods were stored on shelves fastened to walls that ran at a right angle to the source of the blast. Here, the drum-action exerted on the wall by the blast wave shook the containers.

Similar shelves, along walls that stood in direct line with the shock wave, suffered relatively little shaking, and their contents did not fall to the floor. Also, displacement damage was less severe to products stored in basements.

Other damage came from flying glass and wooden splinters. These missiles usually struck foods in direct line with windows or doors.

Here, severest damage accrued in soft-packaged products, like flour and sugar. Obviously, such damage could be largely averted by not storing paper, textile, or plastic-film-wrapped items in line with windows or wooden doors.

Rays Affect Buried Goods

On products stored close to the bomb blast, in the slit trenches covered by a 2-in. layer of soil or loosely placed wood boards, radiation and blast damage were both apparent. Here are highlights from a report on these foods by Edwin P. Laug, FDA's physiochemistry chief:

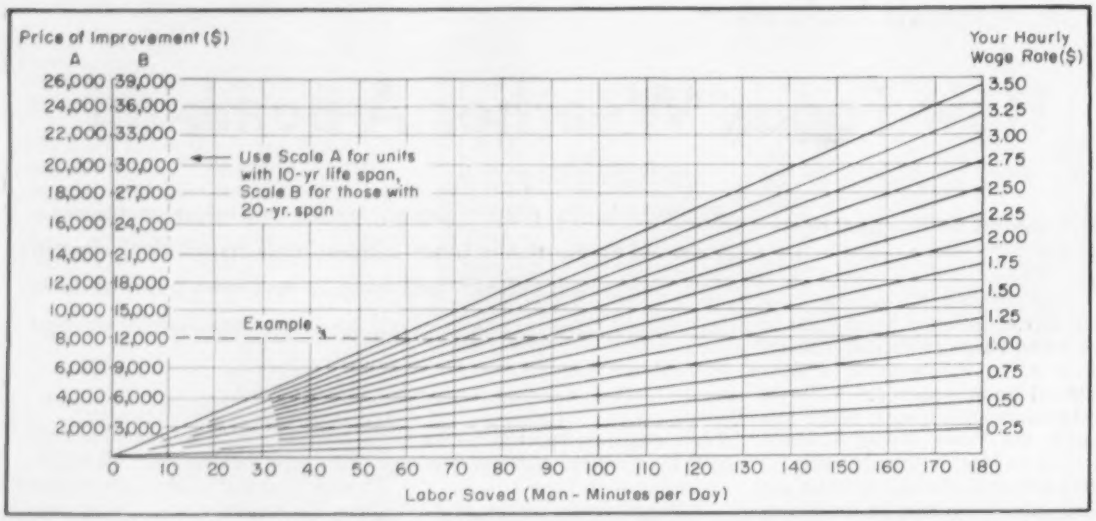
- Physical damage was most severe for soft-packaged or unpackaged bulk foods, stored in open wooden crates and boxes. Semi-perishables—such as apples, onions, and potatoes—were extensively crushed and bruised, resulting in accelerated spoilage.

The 50-psi. overpressure also crushed and distorted some steel cans, broke glass bottles, and split wooden panels. But losses from such damage were relatively light (about 5% for canned foods). And carefully gathered evidence shows that seams of steel cans remained firm under the terrific pressure.

- None of the plastic film bags burst (both empty and filled bags of commonly used sizes were buried in the trenches). However, some of the smaller polyethylene bags were torn, due to crushing of their contents (fresh fruits and vegetables). None of the four plastic film materials used in the test became discolored, nor did any weaken.
- Displacement damage was nil. The earth surrounding the buried foods absorbed lateral tremors of the blast wave.
- All types of containers absorbed

(Turn to page 216)

Tells If Labor-Saving Outlay Pays



THIS TIME-O-METER indicates if that new equipment will pay off. You can work either from labor saved (bottom line) or from price of machine (scales at left). Knowing labor saving in minutes per day, you run a vertical line to your hourly wage rate (oblique lines), then travel left to find maximum investment (for breaking even). Checking other way, you go from cost of equipment over and down to bottom line to find labor saving needed to make outlay feasible. Dotted-line example is further explained in accompanying text.

CHARLES E. FRENCH

Associate Professor, Agricultural Economics Dept., Purdue University, Lafayette, Ind.

"I KNOW IT SAVES LABOR—but it costs too much!

You often hear this statement applied to a new work-saving machine. Yet you catch yourself wondering whether the outlay **really** would be "over the line."

Truth is, even when we recognize the time savings to be gained by a plant improvement, most of us still have trouble figuring whether the benefits merit the expense. That's because savings that pay off over **years** are hard to measure against specific outlays **today.**

But now this simple Time-O-Meter (chart above) has been developed to give you quick answers to such problems. If you know how much time a machine will save you, this device determines the maximum investment you can afford and still break even.

Or, from initial cost you can determine the labor time the equipment must save to pay for itself.

Most persons know that machines cost money **each year** because of depreciation. Too many think this is the only cost. Generally, there are four other expenses—interest, insurance, taxes, and repairs. These "hidden" costs usually amount to about 5% of the initial investment.

Here is the key: When your new installation's annual labor saving matches the project's total annual cost, then you break even. Accordingly, if you get the labor-saving unit for less money, you will net the difference as a profit over the life of the machine.

How to Use the Chart

Scale A on our Time-O-Meter gives representative prices of equipment having a 10-yr. life. Of course, some units will last more than 10 yr., so there is an additional Scale B alongside for equipment having a 20-yr. span.

Assume that the improvement you're considering will win you a work saving of 100 min. a day. How much money may reasonably be expended on the project and still have it pay?

To find the maximum you can spend, locate 100 min. on the bottom scale of the chart, then run up vertically (see dotted-line example) to the oblique line that represents the hourly wage you pay on the operation in question—say $2 per hr.

Now move left on the chart to Scale A and you have your answer: You can expend $8,000 and still come out even on your purchase.

This is all valid if you have calculated your time savings and wage rate correctly. And such factors are always readily computed where you are working with hourly labor and a known rate.

Of course, supervisory time can be a further consideration. And this takes separate figuring, since the salaried value of a supervisor's time can differ from one job to another. A little thought, however, should give you a reasonable estimate for accounting such time.

It Works Both Ways

You can use the chart in reverse, too. Say that some new 20-yr.-life equipment would cost you $15,000. How much labor time must it save you per day to break even on the investment?

Just locate $15,000 on Scale B and scribe a line to the right until you hit the proper hourly wage rate diagonel—say, $2.25. Then drop down to the base line and you have the solution—110 min.

In this case, your savings accumulate over a 20-yr. period instead of a 10-yr. span.

Picture Story—

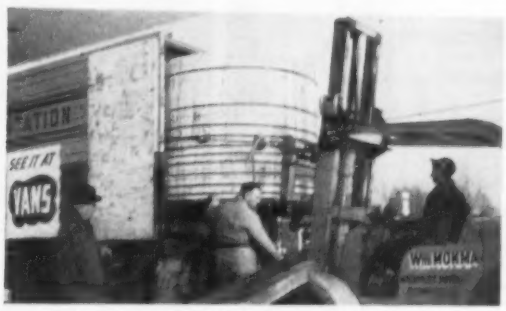
How They Make Those Mammoth Cheddars

11,000 POUNDER "fullbacks" this team of big ones at Steve's Cheese Co., Denmark, Wis. Steve turns them out for the popular supermarket sales promotions. And he's run them as high as 13,000 lb.—taking more than 70,000 qt. of milk, 560 oz. of rennet, 380 lb. of salt, 140 oz. of vegetable color, 65 lb. of paraffin, and 650 board feet of lumber for hoop and platform, along with 50 sq. yd. of bandage and press cloth.

1 **INTO HOOP** of special construction goes huge load of cheddar pieces, carefully made in cheese factory.

2 **TOP BANDAGE** and cover go on, then cheese gets overnight pressing applied by 4x4-in. wooden struts.

3 **MONTH-OLD CHEESE** is paraffined, re-hooped, bandaged, and returned to storage for aging and curing.



4 **READY TO TRAVEL,** giant cheddar (on its permanent, castered platform) is fork-lifted aboard semi-trailer.

Packagers, Cutter-Mixers in Focus

At American Meat Institute Show in Chicago

6 PACKAGING MACHINES

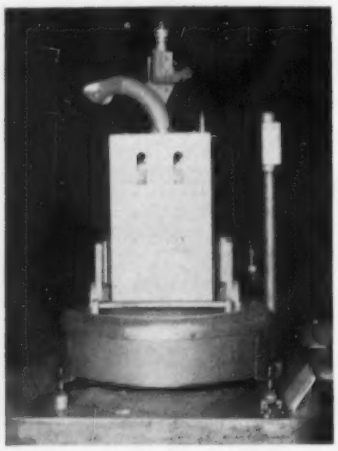
PNEUMATIC sausage-measuring filler operates with any stuffing unit. It's easily adjustable for accurate filling of casings and cans (up to 20 oz). Two-way air-valve action is through foot pedal, freeing operator's hands to handle product.—The Allbright-Nell Co., Chicago. (62A)

TIGHT-WRAP DEVICE. It packages sausage and smoked items in sizes from 8 oz. up to 20 lb. Fractional hp. motor drives air-extracting and plastic-bag twisting unit, along with semi-automatic, aluminum clip-type, bag-closing machine. Exhibitor: The Visking Corp., Chicago. (62B)

FOOT-PEDAL OPERATED machine semi-automatically evacuates, heat-seals, and trims ends of pouch-packed meats. Two-headed unit consists of pair of flattened, adjustable pouch-evacuating and stretching nozzles and wire cutters. Maker: Cryovac Co., Div. of W. R. Grace & Co., Cambridge, Mass. (62C)

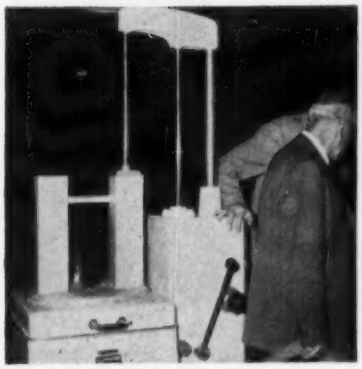
4-IN-1 foot-pedal packer permits vacuum, gas, and vac-gas packing as well as heat-sealing of pouch-packed frankfurters, sausages, luncheon meats, and other such items. A feature of unit is that it converts from vacuum to gas packing by flick of switch. Manufacturer is Cheslam Corp., Yonkers, N. Y. (62D)

SEMI-AUTOMATIC UNIT sets up locked-style cartons at 15-per-min. speed. It packs pre-weighed meats for direct conveyor feed to wrapping machines. Can also be mounted over a scale. Exhibitor: Oster Tool & Die Corp., Chicago. (62E)

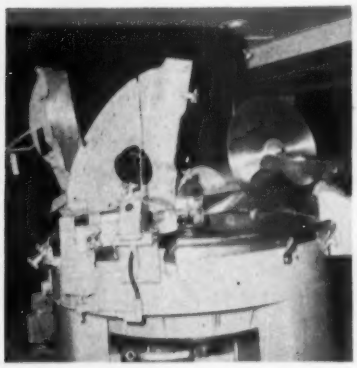


PAN-TYPE LINKER handles 55 ft. of casings per cycle. Makes twist-links in sizes from 4½ to 6 in., 1,100 lb. an hr. Counter-weighted hood is pneumatically opened and closed.—Kartridg-Pak Machine Co., Chicago (62F)

5 CUTTER-MIXERS

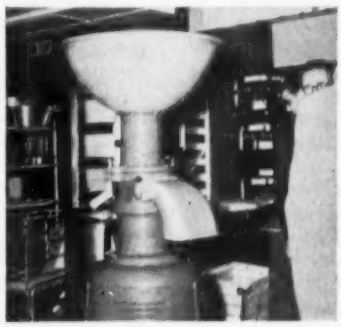


SPECIAL hydraulically operated machine is built for semi-automatic dicing of meats. Unit has non-leak features, and working parts are at a minimum. Operator fills one cylinder, while dicing meat in other.—K. C. Seelbach Co., Inc., N Y. C. (63A)



THIS MACHINE directly cuts meats, thereby eliminating intermediate grinding step. Specially designed stainless knives run at high speed. Sanitary and safety devices are stressed in ruggedly built unit.—John E. Smith's Sons Co., Buffalo. (63B)

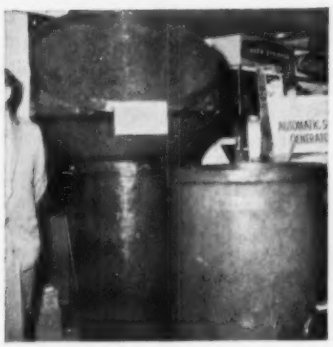
HIGH-SPEED 50-hp. motor-driven emulsifier minces 200 lb. of meat per min. Unit has six knives, operating at 2,000 rpm. and mounted above perforated plate. Displayer: Griffith Laboratories, Chicago (63C)



GERMAN EMULSIFIER, powered by 40-hp. motor, minces up to 180 lb. of meat per min. It features two stainless, saw-tooth knives mounted over accessible perforated plate.—Krötz Universal Cutter Co., Stuttgart, Germany. (63D)

COMPACT emulsifier minces 500-2,000 lb. of meat per hr. Equipped with 15 hp. motor and long-lasting, helical, hardened, easy-to-clean cutting gears. Distributor: First Spice Mixing Co., N. Y. C. (63E)

BRINE TANKS, WALL COATINGS



LIGHTWEIGHT, rugged, corrosion-resistant brine make-up tank is constructed of polyester resin-reinforced Fiberglas. Exhibitor: Industrial Div., International Salt Co., Inc., Scranton, Pa. (63F)

NEW COATINGS (base and high-gloss) provide sanitary tile-like surface on concrete, cement block, plaster, brick, composition, and wood walls and ceilings (1 gal./400 sq. ft.)—Master Mechanics Co., Cleveland. (63G)

For detailed data on units circle key number on Readers' Service Card in back of book

Ole Sage Episode

WHAT TACTICS ARE BEST WHEN UNION ORGANIZERS CALL AT YOUR PLANT?

IVAN C. MILLER
Associate Editor, "Food Engineering"

Batt painted a dismal picture: "He'll storm into your office and slam down a fistful of signed cards."

AS COFFEE WAS POURED at the November luncheon of the Guff & Gripers, all eyes were on the guest, Bertram Barnastian, senior partner of Barnastian Bros. Bakery Co.

This was a man who had successfully piloted his company through a mushroom growth—from a tiny local operation into a 300-employee frozen bakery products company with established regional distribution and a highly respected brand name.

"You'll all remember," remarked Barney Hasbrook, "what I said when our Fall Outing broke up last month. Mr. Barnastian had mentioned to me that a union was trying to organize his plant. Anyhow, he asked me what I thought about it. And we agreed to put the question up for you G&G'ers to thrash out, with him sitting in."

"Better first tell us the background," suggested Si Worth, personnel manager at Zenith Canning.

"Okay! The floor's yours, Bert, so give them the details," said Barney. Then after he had produced pencil and paper, he added: "But take it slow. I want to jot down notes to pass on to J. J. Talmerage—the one who was particularly interested and who originally brought this up."

Bert, a small, soft-spoken man, explained: "A few years ago, when our youngest brother came with us, our bakery was really too small financially to care for us all. We decided it was a case of split up or expand, and we did the latter.

He paused to peel the band from his cigar, then continued: "Anyhow, we gambled on convenience foods—first frozen pastries, then frozen specialties. We were very fortunate. Our products clicked.

"Back in those days, though, I knew every employee personally. But now they're strangers, most of them. You see, while my brothers are running the plant, I'm out arranging for financing, or traveling the country developing outlets and working with jobbers and distributors. So it's very seldom that I'm at the plant anymore."

"Y'mean you're in the big leagues now," cut in Batt Bulwark, works manager at Mull & Mull Co.

"Yes, for us it's big league," admitted Mr. Barnastian. "But, we're still astonished at our growth, and very apprehensive, too, as a matter of fact. Seems that despite the expansion and our working many more hours a week than formerly, we're actually no better off financially—except on paper. This kind of a build-up costs money, and banks charge interest. That's why we're concerned over this drive to unionize our people."

"I would guess then," commented Si Worth, "that this bakery's wage rates are somewhat below those of the industry or the area."

"To the contrary!" Bert hastened to assure. "Actually, our rates are equal to, or above, those paid for comparable work in this field. As long as we've been in business we've paid comparable or higher wages."

"Then, Mr. Barnastian, why are you worried," asked Luke Markham, superintendent of Colossal Candy Co. "Worse can happen than having your people join a union."

"I'm sure you're right," Bert admitted. "But, as I explained, "we're up to our necks in our one big gamble, so we're not ready to face another."

"You don't have to be afraid of the union," Si assured him. "In fact, unions have been assets to many manufacturers. So much so that a good number prefer the union setup to the old status when the workers were non-union."

"That reminds me of a surprising happening," reminisced Ole Sage. "Some years ago, employees at a big food organization on the East Coast twice voted against unionization. Then the firm's president came out at a mass meeting of more than 1,000 of the company's employees and pointed out a national trend toward 'the democratic procedure' of union representation of employees.

"He told them he was convinced a majority of employees secretly preferred union representation. Then he added that he believed such a move would benefit both company and employees, and so he was recognizing a local union as their bargaining agent. This action was voluntary. There was no strike and no threat of one."

"Coming from you, Ole, that must be true," surmized Batt, "which makes it one actual case of 'man bites dog.'"

"Don't misunderstand me, gentlemen," broke in Bert Barnastian. "My brothers and I are in no way anti-union in our thinking. A year from now the same situation might concern us very little. It's the timing. Right now we're swamped with the details of getting the new ship well on its way and . . ."

He paused and gazed reflectively at the ash tray in front of him. "Well," he then went on hesitatingly, "there is—I must admit—one other element: While most unions are respectable and ethical, not all are. And I've got reason to believe that some of them that operate in our locality are in the hands of goons and racketeers.

"Anyway, considering how delicately balanced we are just now, it wouldn't take much in the way of excessive demands, jittery morale, or heavy production losses to ruin us. A strike would do it—almost certainly."

"Has the union's agent talked with you yet?" asked Ole.

"No, I've been away for almost all of the last month," explained Bert. "But we definitely know an attempt is being made to organize our people. And this brings up my question—which I ask out of curiosity, not meaning that anything would be done about it by the company. In short, is there any way to prevent organizing activities at the plant?"

"Oral solicitation by an employee," Ole began outlining, "can be barred during working time. And also—in the interest of plant cleanliness—the employer can prevent anyone from passing out literature in the plant at any time.

"A company," he went on, "may prohibit union agents from entering the plant or distributing literature on company property. The latter prohibition hinges on company rules, which must apply uniformly to all others."

After a moment's pause, Ole concluded: "It has always seemed to me that such restrictions encourage, rather than curb, organization activities and results—with the exception that an employer is fully justified in insisting that there be no solicitations during working hours."

Batt Bulwark waved his stogie to command attention, then snorted: "Mr. B., you'd better get ready. You can expect that union agent any day now." Then looking down the table, Batt continued his dismal picture: "He'll storm into your office, claim that anywhere up to 90% of your people have already signed union cards. Then he'll slam a fistful of 'em on your desk and demand recognition of his union as representing your employees."

"If so—then what?" quietly asked Bert.

Hurriedly, Barney Hasbrook cut in with a caution. "Likely Batt'll tell you, 'Throw him out!' But before you 'buy' anything like that, just remember: You may, in the future, have to sit across the table from this man—negotiating, bargaining, settling differences. Always keep that in mind during your first meeting with the agent, and for that matter when dealing with any other union reps in any future contacts."

"Even so," countered Batt, "chances are the pug's bluffing if he shows you a bunch of cards. It's an old gag. Cards are easily 'phonied.' Believe me," Batt bellowed on, "if you do sign, you're hooked. Then *he's* got his union in *your* plant. And *he's* the boss of *your* employees, whether *they* really want it that way or not!"

Ole turned to Bert. "On one point," he said, "Batt's right. Don't immediately sign an agreement with an agent. However," he continued, "there's this to consider: Even though most of your people are satisfied, it's pretty sure that these union activities mean that some of your employees—a dissatisfied few, no doubt—applied to the union. And," he added, "it's also possible

WITH THE UNION WORKING to get into the plant, things look tough to Bert Barnastian. And when Batt has his say, they look even tougher . . . But then Ole sharpens the focus on the NLRB facts

that the idea may have taken a greater hold than you realize. It may even be that the majority of your workers want the union."

Apparently confused, Bert asked: "Then what is to be done if a union agent tells you the majority of your workers have signed union cards?"

"That is a tricky situation, and it calls for kid-glove handling," cautioned Ole. "First of all, don't lose your head. Be courteous but definite. Explain that only your employees can decide on union representation, and then only by an election, which you understand must be arranged and supervised by the National Labor Relations Board—a Taft-Hartley requirement, you know."

"Mighty smart!" chuckled Batt. "Let them know you're 'up' on the laws—especially T-H. And as for signing up with 'em, it's not legal to bargain with the union unless the Government has authorized that union, and then only *after it's won* an NLRB election."

"What's more," resumed Ole, "if the agent *is* bluffing, you won't hear from him again once you've told him that an NLRB election must determine who represents your people.

"On the other hand, before the union can claim to speak for your workers in collective bargaining matters, it must first have the signatures of at least 30% of your employees—on a petition or on union cards. So if the agent is confident the majority wants the union, he will respect your knowledge. Also, he'll welcome a Government-supervised election."

"Who notifies NLRB?" queried Bert.

"Any employee or group of employees can petition the Board," answered Ole. "Or a union organization, acting in the workers' behalf, may send in a petition. The employer also may so act when an employee-representation claim and demand for recognition is made by either an individual or organization."

"Then what happens?" probed Bert.

"After notification," explained Ole, "an NLRB field examiner will determine if the needed number of employees—30%—are signed up. If it's proved that they have, he'll then call you and the union agent into an informal hearing—to get your consent for the election and to set a date for it."

"Suppose you hold out?" needled Batt.

"Usually, that's not wise," said Ole, "because later the union might propagandize such a refusal—arguing it shows you're 'opposed to labor,' 'reactionary,' and that sort of thing."

"All right, so let's say you agree to an election," Bert pursued. "Then what follows?"

"Well," said Ole, "before election day there will be many things to do. Also a number of things not to do."

"Such as?" queried Batt. "Let's have some 'for instances,' starting with the do's."

Barney broke in: "Too late in this session to do justice to all those do's and dont's."

"Yes, we'll have to save 'em till next time," announced Luke as the men started after their hats.

FE OPINION

FRANK K. LAWLER, Editor

It Takes People to Make Capital Pay Off

In this era of rapid re-engineering of food factories and processes, great emphasis is being placed upon streamlining of mechanical facilities. And rightly so. Without improvement in efficiency and capacity, and without tooling up for new convenience products and packages, food companies would be overrun by competition.

But just as much emphasis should be placed upon the human phase of food manufacturing operations. It takes people to make capital of capital expenditures—not only to see new opportunities, but to make that expensive factory or process pay off in full measure.

Here the food industry has room for improvement. It is not as attractive to ambitious young people as it should be. Many do not see in it the challenge and excitement associated with many other fields. Others believe that the personal rewards are not as great as elsewhere. And some complain that top management does not extend to junior executives the responsibility and authority necessary to prove their mettle—nor to satisfy their ambitions for personal achievement and progress.

In the smaller and medium-size companies, particularly, these obstructions to progress through people need to be removed. The prime mover behind any industrial success is enthusiastically applied intelligence.

Top management in all companies should glamorize food as a field in which exciting new processes, products, and technology are introduced at a challenging rate. And it should "sell" the industry as one that is contributing to longer and happier living.

Then management should back up the challenge of the industry with more reward to high-caliber people. Sure, this will boost expenses a little. But the extra cost will be an investment in economy if it gets you more return on your capital investment.

Top executives also should better organize management at the lower levels. Responsibility should be delegated in fact, not just on a chart, and be backed up with commensurate authority. An executive should ask himself if he is doing anything that someone under him can do as well as he did it three or four years ago. If the answer is "yes," then he should delegate the job—and the authority. By so doing, he frees himself for more valuable work. At the same time, he develops the subordinate and makes him better satisfied and more effective.

You can't treat men as tools which you buy and anchor to one spot. You can't because progress is their most important payment.

Antibiotics No Substitute for Sanitation

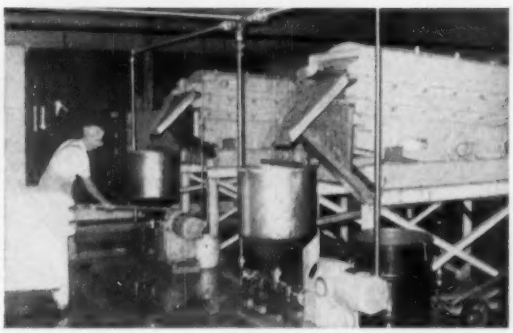
With approval of oxytetracycline as a spoilage inhibitor for fresh poultry, another step is taken in "preserving" foods with antibiotics (p. 196). And a competitive battle of the antibiotics is launched.

This is progress. But smart poultry packers will not overwork it. They will not substitute an antibiotic for sanitation, refrigeration, or quality control. To do so would be to defeat progress.

SIMPLICITY

new developments in food screening

INFORMATION ON PROCESSING FOOD AND WASTE PRODUCTS



TOMATO SEED AND JUICE PRODUCTION COMBINED

Often, by correct screen application, two processing problems can be solved as one. For example, a dual problem faced the Francis C. Stokes Company. This large tomato seed producer needed a seed removal method that would not affect germinating qualities. At the same time, they wanted to produce a juice of the highest possible richness. They found that our double-deck Simplicity Tomato Screens combined the operations of juice production and seed separation entirely to their satisfaction. The balanced gyrating action of the screen scrubs the juice and pectin from the tomatoes so vigorously that the skins are actually transparent when discharged, and the juice is relatively free from black specks even if the tomatoes are badly cracked, which allows a saving on trimming labor. Seed germination has been reported excellent. The Simplicity Screens . . . five of them are now installed at Stokes . . . are constructed of stainless steel to prevent any contamination, and trays can be removed for easy cleaning. Write us for details on how a Simplicity unit may aid your operation.

SEPARATING 80 BUSHELS OF PICKLE SLICES PER HOUR

Working off an Urschel slicer set for 1/10″ to 3/8″ slices, this Simplicity 3′ x 8′ Gyrating Screen is removing ends, half slices, and broken slices from 80 bushels of pickles an hour. Only unbroken slices with centers missing remain to be removed by hand. The pickle processor finds that both his quality and his total output are improved, and, as noted, hand labor is reduced to one simple task. Pickles, however, are not the only food for which this machine is adapted. Carrots, beets, and other sliced vegetables are accommodated equally well. If you are canning or freezing such foods, you may find your operation considerably speeded and otherwise improved by the Simplicity Model "C".

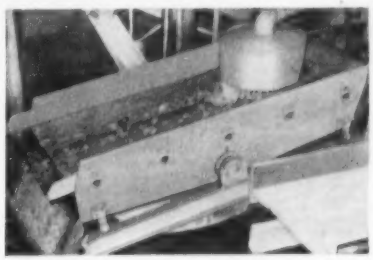
"LITTLE" SCREEN IS A BIG HELP IN SCREENING SMALL FOODS

A processor in Benton Harbor, Michigan has found five of our 18″ x 36″ Model M-5s to be a marvelous answer to the screening of strawberries, cherries, and similar small-size fruit. This M-5 Simpli-Flo can screen materials as fine as 80 mesh; will fit in almost any corner of a plant, and is amazingly efficient. It has a counterbalanced eccentric shaft to give true circle action and eliminate vibration in the main structure . . . the main structure in this case being a supporting table of tubular construction. The Simplicity M-5 can be equipped with a stainless steel deck or all stainless steel construction where desired. If you have a small operation you'd like to mechanize, we'd like to show you how our little M-5 can be a big help.

VIBRATING PAN PERFORMS TRICKY FOOD CONVEYING JOBS

Not everyone is aware of the multitude of different food processing tasks that can be handled by a vibrating pan conveyor. A number of leading food processors use a Simplicity Balanced Pan to cool and convey powdered coffee. Others use the same machine for drying their various products. Still others have found it ideal for conveying friable materials such as grain or cereal, because it does not reduce the product or create dust. The Simplicity Balanced Pan Conveyor has also been used as a sorting table. Although always basically a conveyor, the Balanced Pan can perform many other operations in addition, and can be fitted out with dust-proof covers or other equipment for specific jobs. You may have a place in your operations where this adaptable unit could help. If so, ask us for details.

HOW TO CLEAN UP WASTE WATER



Solids in waste water can cause a lot of trouble, especially in view of the short water supply in ma../ areas and the drive against stream pollution. Yet a simple screening operation can to a great extent solve this problem. King Pharr Canning Operations, Inc., of Selma, Alabama, find that one Simplicity 3′ x 6′ single deck screen more than adequately removes waste from the canning of okra, sweet potatoes, pimentos, and blackberries. The screen receives a surge of 300 gallons per minute from a 4″ trash pump. This is a very fast, efficient way to clean up waste water, and the cost is small. We'll be happy to make recommendations on your plant disposal problem, too.

Write for information on any of these pieces of equipment or for Bulletin FC-3

SIMPLICITY ENGINEERING COMPANY

DURAND 17, MICHIGAN

SALES REPRESENTATIVES IN ALL PARTS OF THE U.S.A. • FOR CANADA: Simplicity Materials Handling Limited, Guelph, Ontario • FOR EXPORT: Brown and Sites, 50 Church St., New York 7, N. Y.

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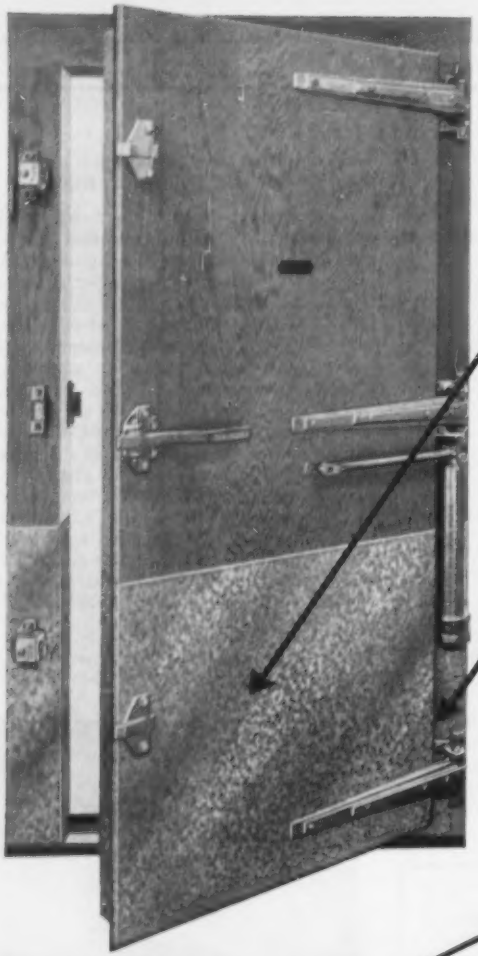
Waterproof boot protects door and frame from rotting caused by wet floors

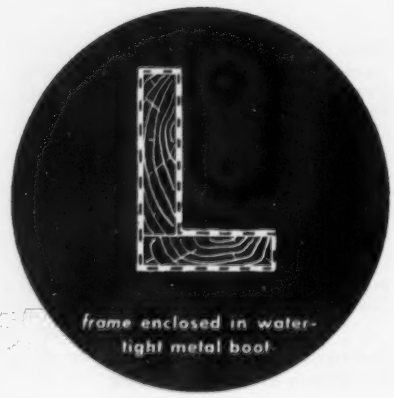


waterproof metal boot on door

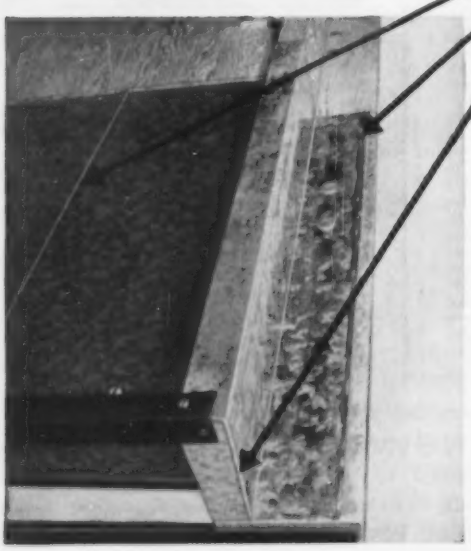
waterproof metal boot on frame

soldered seams make metal cladding watertight

door enclosed in water-tight metal boot



frame enclosed in water-tight metal boot



Frequent floor washing with water, steam or cleaning solutions will never rot the bottom of Jamison *Booted* Dairy Doors. The complete protection of the wrap-around metal cladding keeps water from penetrating into the door or frame. Full height waterproof boots also available for complete protection where walls and doors are washed down. Jamison Cold Storage Door Company, Hagerstown, Md., U.S.A.

JAMISON

HAGERSTOWN, MARYLAND, U. S. A.

More JAMISON Doors are used by *more* people than any other Cold Storage Door in the world.

← For more data, circle this page number on card at back

VERSATILE flexibles give appeal, protection—permit many innovations, like this bag-into-pan item.

PROGRESS IN FLEXIBLES
Offers New Package Opportunities

SPECIAL REPORT

Developments Set Fast Pace
They're Making Better Flexibles
New Packages Appeal, Simplify
Things You Should Check
158 Suppliers of Flexibles

PRODUCT PROTECTION is built into special material used to envelope-pack mixes (right) that easily reconstitute into various salad dressings. Employed is polyethylene, aluminum foil, and special paper, plus a heat-sealable coating.

DEVELOPMENTS Set Fast Pace

Spearheaded by demands resulting from food industry trends, an intensified search for new and better performing materials is paying off in innovations that will solve packaging problems

JOHN V. ZIEMBA

Associate Editor, "Food Engineering," who researched trends and developments in flexible packaging and prepared this and the following sections of this Special Food Engineering Report

IN THE BIG FIELD OF PACKAGING, nothing outranks food in importance.

And nothing is more exciting and important to food packagers than flexible materials. That's because the flexibles are presenting new opportunities, new challenges.

They're protecting the flavor, freshness, and quality of foods.

They're assuming the main selling role in retail stores by drawing attention, holding interest, and silently making the sale.

They're telling their story—quickly and effectively—through pleasing, ingenious construction and expert use of colors and designs.

TODAY AND TOMORROW

Specifically, they're going into: Wrappers, package overwraps, carton liners, bags within cartons, bag liners, paperboard liners, carton windows, carton inner-wraps, canisters, pouches, and packets—as well as labels, inserts, dividers, and fluted cups.

And they're being adapted to low-cost operations on high-speed packaging lines.

Processors have come up with the new technique of inhibiting spoilage by antibiotic treatments, and they are researching into radiation "pasteurization." In both cases, flexibles promise to play a key role.

Package manufacturers also are getting their turn. They're developing new flexibles that are making more and more food packaging less dependent upon rigids. Already, flexibles are getting a little share in the packaging of syrups, sauces, mustard, jellies, cream, and brined pickles.

What's Ahead in Flexibles—

New plastic films—some improved
Wider range of coatings
More laminations—some improved
Better printing quality
Wider applications in food industry
Smoother performance on packaging machines
Newer and more efficient mass-production techniques to lower costs
Materials to withstand thermal sterilization
Packages treated with antioxidants, moldicides, insect-repellents, etc.

DIFFICULT-TO-PACKAGE chicken livers are put up in laminated polyethylene-cellophane envelopes for freezing. The livers then are distributed by Sunnyland Packing Co., Thomasville, Ga. The envelopes contain 8 oz.

Package and machinery manufacturers have introduced vacuum- and inert-gas packaging techniques. New flexibles used in these methods are moving product shelf-life up another notch.

Today's rising prices have the food industry calling upon makers of packages to provide protective flexibles at lower cost.

From what's been going on, the packaging and food industries have a pretty good right to toot their horns.

And as both look to broader horizons, advances in food packaging will continue.

TREND TOWARD CONVENIENCE

Modern, eye-appealing flexible packaging is a "natural" in our present extensive food-distributing and retailing methods. That's because:

It provides sanitation, brand-identification, and greater convenience.

It gives food processors low-cost, light-weight, widely adaptable, highly efficient, and easy-to-fabricate packages.

It paves the way for more new foods. In many cases, the package has even made the product possible.

Shoppers don't want food in any old form. They're looking for food *plus* convenience. And think of the many new conveniences flexible packaging is offering:

Zip tapes on cellophane and cellulose acetate permit easy and speedy opening of packages.

There's no deposit or disposal problem. Just crumble up the packages, after using up the products, and toss them away. Or re-use them (polyethylene bags).

There's the "built-into-the-package service"—complete pre-cooked dinners of precisely uniform quality that but yesterday were gourmet dishes available only in restaurants.

Convenience packaging has sparked the merchandising of easy-to-prepare cake, cookie, and roll mixes. An example is the all-in-one package. Here, individually pouch-packaged cake and frosting mixes are carton-packed along with a disposable foil baking pan. A convenience if ever there was one!

Related combinations like frankfurters and rolls (or franks and sauerkraut) are appearing.

Look for more rigid bags that make for better display and remain conveniently upright once opened.

Even possible are edible wraps that dissolve and flavor the product.

Finally, foods are made conveniently available in a variety of ways—fresh, frozen, and dehydrated, as well as canned.

SELL-ON-SIGHT PACKAGING

With the terrific trend toward self-service, packages are becoming "eye-stopping," "come-on-and-buy-me" salesmen.

So look for more appetite-appealing food reproductions on opaque wrappers for greater point-of-sale impact. Better flexible materials are permitting extremely fine color-printing quality.

More calendered and glossy-coated papers are being employed to improve printing quality. Using superior surfaces, brilliant multi-color rotogravure printing is achieved.

Helping, too, is a jump in the number of printing colors—from 3 or 4 to 5 or 6—within the last few years.

Printing inks have been developed to resist heat generated by the sealing jaws of wrapping and bagging machines. Sealing heat merely releases the solvent and makes the inks adhere without damaging the ink films.

Shaping up are two notable developments—vastly multiplied output on packaging lines, and shorter shelf-life packaging with lower cost materials.

A word about the latter: Some processors, such as those putting up specialty-type frozen foods for limited distribution, are focusing less attention upon extending product shelf-life. They're using lower cost flexible materials, and consequently are scheduling production so as to move the products more rapidly to consumers.

TESTS are constantly underway in laboratories of both suppliers and food processors to evaluate the flexibles and their finished-package performance. Here, refrigerated display case is used to simulate self-service shopping conditions. Packages and foods are periodically examined to see how they're standing up.

TOP PRIORITY is given to packaging materials by the paper makers. Quality is carefully control-checked at key stages of processing, from pulpwood to finished paper. Seen is calibration of paper thickness by latest radiation technique. Also, there are organoleptic tests to evaluate materials for odor, flavor, color, and other pertinent characteristics.

This way, they're also cutting down on in-plant inventories and expensive freezer-storage space.

However, a number of large processors still are adding product protection and extending shelf-life because of their extensive, wide-area distribution.

ACCENT ON RESEARCH

A lot of creative talent is being applied in package-makers' plants, engineering departments, and laboratories. Specifically being looked into are:

1. Laminating, coating, and printing of a variety of papers, films, and foils.
2. Suitable coatings, laminants, and inks—as well as methods for applying and drying them.
3. Thermoplastic materials, compounds, and heat sealing.

They're searching, too, for ways to improve new extrusion products and are working to develop new techniques for forming film, seamless tubing, and extrusion coatings.

They're trying to come up with surface-treating techniques to improve ink adhesion on plastics like polyethylene.

They're even attempting to develop new packaging materials and machinery simultaneously so that they perform most efficiently together. This way, they may come up with some radically new packages.

MACHINE PERFORMANCE

They're seeking ways to make flexible packages operate more smoothly on high-speed equipment—bag makers; machines for forming, lining, and over-wrapping cartons; fillers; weighers; gluers and heat-sealers.

To get materials to perform better, they're:

. . . Using more virgin instead of reclaimed pulp to get precisely accurate scoring (eliminate odors, too) of laminated cartons.

. . . improving the surface-slip of materials so that they slide better through wrapping machines without scuffing, "hanging up" on folding bars, or piling up on conveyors. This advance can be seen in polyethylene, for example, where slip additives make bags open easier, and clinging-type film runs more efficiently through wrapping machines.

. . . Getting around sealing problems with overall heat-sealing, spot-coating, and laminating tricks.

. . . Putting more strength into materials, and instructing users on proper handling to check drying out and shattering. This way, there are fewer broken bags and spilled products, as well as less rethreading of roll-stock on wrapping machines.

. . . Producing wraps with higher blocking points to prevent "tear off" and consequent rejections and rethreading of wrapping machines with a new roll.

. . . Employing harder coatings to prevent marring and "rub-off."

. . . Turning out printed roll-stock which doesn't stretch or shrink too much and thereby put "eye-spot" printing registration out of line and cause improper wrapper cut-off.

. . . Eliminating curling of wrapping sheets by selecting the right materials to make up a lamination. Each ply has comparable stretching and shrinking properties when subjected to moisture or temperature changes.

They're adding such other food-spoilage protecting materials to flexibles as antioxidants, mold inhibitors, and insect repellents. Low-cost coated papers treated with Lindane or methoxychlor, for instance, show promise of checking insect infestation.

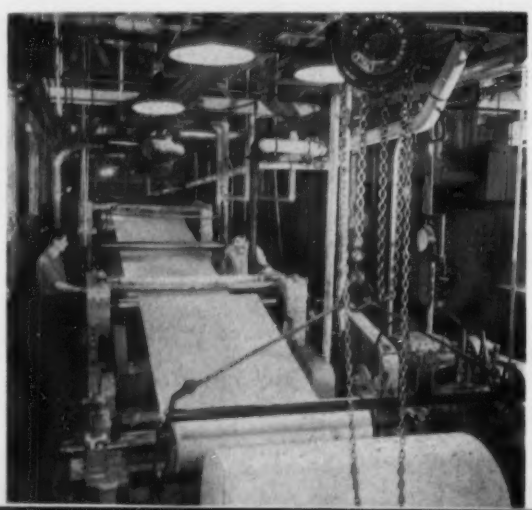
They're producing materials that permit colored photos of ready-to-eat foods to be printed so realistically that shoppers can almost "taste" the products.

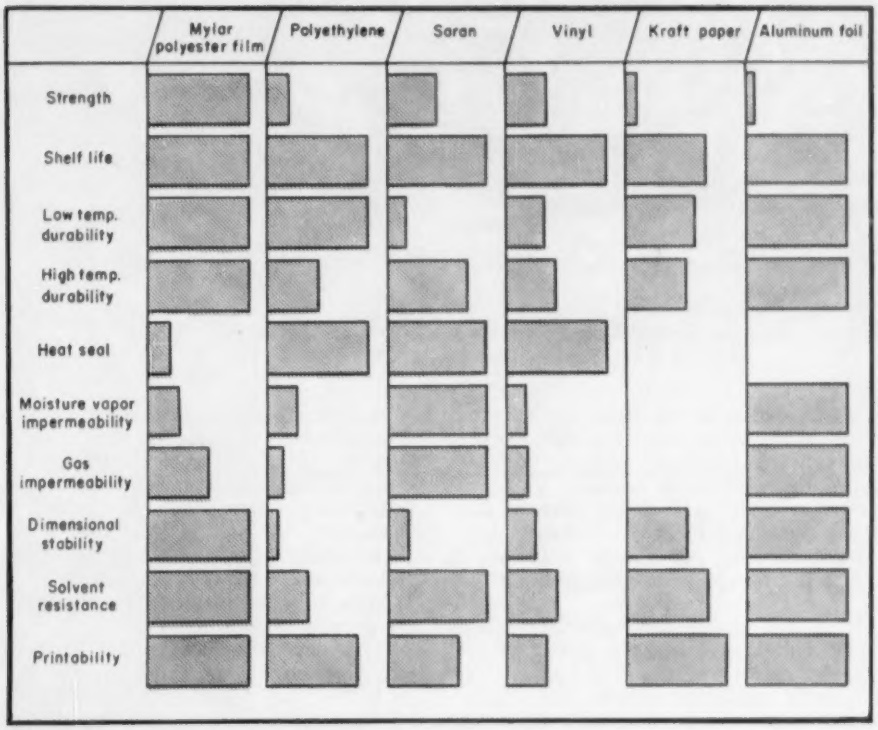
And they have the future definitely in mind with long-range programs for solving other problems.

WIDE RANGE OF SKILLS

More manufacturers of packaging materials are becoming specialists in packaging machinery. In addition to their field-sales team, some are setting up a machinery-service organization. This way, they're helping food processors run materials through machines more efficiently, with fewer crippled packages.

HIGH-SPEED LAMINATING machines automatically convert papers into specialized sheetings having improved physical, chemical, and product-safeguarding properties. Waxing, coating, and a combination of these processes, are used to "engineer" new characteristics into various back-up papers. Continuing research aims to produce new and better laminateds.





PROPERTIES of selected flexible packaging materials compared in handy bar chart. By combining flexible materials as laminations, shortcomings of each may be offset. (Chart is from paper by W. H. Wood, du Pont, presented at Packaging Institute forum.)

They're Making BETTER FLEXIBLES

Thus augmenting product protection . . . Improving production-line performance . . . Paring packaging costs . . . And extending uses of the materials

BETTER FUNCTIONAL PROPERTIES are now being built into flexible packaging materials.

No one paper, film, or metal foil has the functional properties to fill all the needs in packaging all types of foods. But what one lacks often can be compensated by laminated combinations of films, or by coatings.

Tailor-making packages actually boils down to this: There's a large variety of flexible materials and an equally large selection of coatings and adhesives. Through proper choice, these can be fabricated into a composite material with desired protective and performance properties.

Coatings may be applied to papers or plastic sheets. Any combination of papers or films can be laminated to one another or to foil. Or they can be coated and then laminated in just about any set of combinations.

Laminations are tailor-made—according to careful specifications—with product-protecting and easy machine-handling features. Noteworthy are such impressive combinations as polyethylene-Mylar, Saran-Mylar, acetate-foil, poly-paper-foil, Saran-foil, and vinyl-foil.

Here are some major types of combinations:

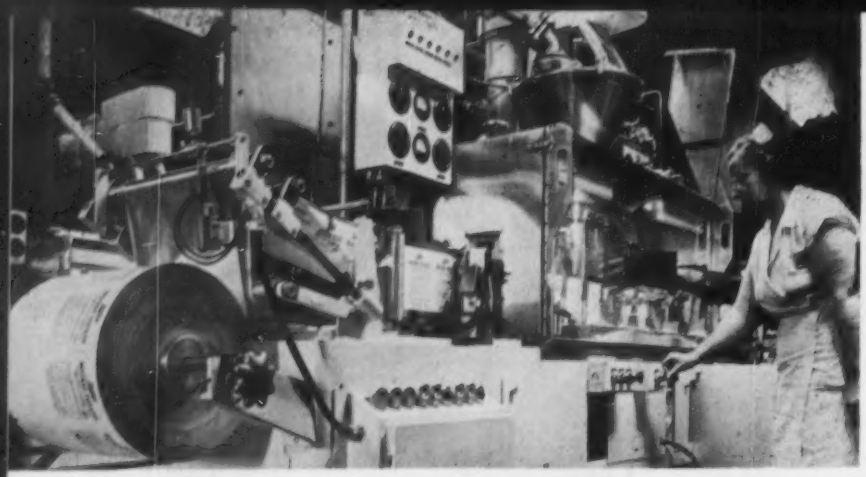
1. Two hard-faced sheets—like glassine laminated to cellophane or to cellulose acetate.
2. Open- and hard-faced sheets—such as kraft, paperboard, or sulfite paper bonded to glassine or parchment.
3. Two open sheets—like light-weight sulfite or kraft papers.

Watch for new coating and laminating techniques.

Coming are new ways to cut the cost and extend the market of flexibles. Butyl rubber, for instance, is being added to a wax coating on glassine to give an extra-tight seal. This would provide crackers, for example, with better moisture protection, make them stay crisp longer.

Further work aims to develop thermo-setting resins that will impart heat resistance to laminations.

Special coatings are applied to base materials to get



THERE'S A TREND in food packaging to use of flexibles in roll-stock form—as these rolls of polyethylene-coated foil Machine makes pouches, which are then automatically filled. Product here is French's Instant Potato. Units are also packing certain products by vacuum and inert gas techniques.

any one or a combination of additional properties, like a heat-seal closure, improved printing surface, moisture vapor barrier, enhanced eye-appeal, exclusion of foreign odors, and retention of desirable aromas.

The coatings are made up of molten waxes of many kinds, hot melts, modified rubber, polyethylene, vinyl, solvent-type nitrocellulose, and Pliolite. Each has its own specific properties, appearance, and degree of protection.

Base materials are printed before or after coating. When printed and then coated, the coating protects the printing, also guards products from inks.

Possibilities with coatings are endless.

Laminations—usually two or more plies sandwiched with an adhesive—are also coated, giving the composite material still more good properties.

Coated laminations, like single-ply coated sheets, also print beautifully. They may be either transparent to show off products or opaque to check transmission of harmful light.

Low molecular polyethylene has been added to petroleum waxes during the past 5 years to improve rigidity and gloss of wax-coated papers.

Abrasion-resistant epoxy coatings have been lab-tested. Perhaps the only food use of this expensive coating, however, is for fibrous casings in the sausage field.

Saran continues to get a big play because of its grease resistance and low moisture-vapor and gas permeabilities. And when du Pont sticks with it as a coating for cellophane, it's a sure bet it is highly effective.

Resin-wax blends are main standbys. Adding 20 to 25% vinyl chloride resins to petroleum wax, for instance, increases the luster, as well as the grease and water resistance of the coating. Tendency to smear and collect dirt is also reduced. Foils are vinyl-lacquered to make them more scuff resistant.

COATED PAPERS

There are a myriad packaging-material combinations that can be produced from papers and thermoplastic resins.

Take what's being done with the oldest and simplest coating, paraffin wax. Applied to glassine, for example, this hot melt gives it gloss, water-repellency, moisture-vapor proofness, and some heat-sealability.

Now modify the wax with resins (heat-treated rosin and hydrogenated rosin ester) and friable film formers (butyl rubber of poly-isobutylene). Here you have a coating that improves the scuff resistance, gloss, and heat-sealing properties of glassine.

Solvent coatings, on the other hand, not only improve glassine papers in respect to these three characteristics, but also give them excellent moisture-vapor proofness. Such coatings may be made up of vinyl, ethyl cellulose, nitrocellulose, cyclized rubber, and some thermo-setting materials.

Butadiene styrene copolymer is formulated with paraffin wax to make a new coating with excellent resistance to moisture-vapor transmission and with good heat-sealing properties.

Most important today, however, are the polyethylene-coated papers. For one thing, cost of this coating plastic is low.

Further, polyethylene has fine coating characteristics, very good aging and heat-sealing properties, and resistance to moisture, moisture-vapor, and chemicals. Flexibility is retained in the —75 to 200F. temperature range.

Here are some recent interesting applications of polyethylene-coated papers:

As wrappers—especially where the poly surface is in contact with frozen foods and, thereby, serves a releasing agent upon unwrapping. An aluminum foil, paper, and poly combination has caught attention as a wrap for hygroscopic products.

Poly-coated cellophane for meats, seafoods, dessert mixes, confections, frozen orange juice, olives, pickles, etc.

As the inner ply for waterproof multiwall bags.

As inner liner (1½- to 5-mil coating on white kraft board) for rigid paper containers.

As an inner liner (poly lamination of kraft and greaseproof papers) for spiral-wound fiber tubes.

POLYETHYLENE-COATED MATERIALS

The food industry continues to call for better packaging materials, chiefly because its "appetite" has been whetted by the outstanding ones already used.

Opening up a new field of packaging are the polyethylene-coated materials.

One supplier points out that over a thousand different flexible materials can be made available by polyethylene-coating and laminating a variety of back-up webs to produce opaque and transparent combinations.

Witness some of the poly-coating possibilities:

1. Foil and poly coating—an opaque, readily heat-sealable frozen food wrap with a low moisture-vapor-transmission rate.

2. Foil, paper, and poly coating—a stiff, economical, heat-sealable wrap with good moisture protection.

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Polyethylene-cellophane "Durafilm" package is supplied by **The Dobeckmun Company**, Cleveland, Ohio.

there were five main considerations in adopting this

Polyethylene-laminate package

"They are all of importance," emphasizes R. W. Taylor, president, American Poultry & Food Co., Inc., Gainesville, Ga.

"Ours is frozen *pre-cooked* fried chicken. We want: (1) customers to easily differentiate between ours and other products, (2) flexibility to conform to varying sizes and shapes, (3) ability to get an absolute seal against air and moisture penetration, (4) savings in cost, (5) top attention in the frozen food case where space is at a premium."

Sales have shown how right the package selection was. And *your* sales can show excellent growth if you capitalize on the advantages of using polyethylene-cellophane laminates for your packaging. Call your supplier, or write for our "Processed Foods" booklet to Dept. NA-63.

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3. Glassine, foil, and poly coating. Crystal clear and greaseproof glassine can be reverse-printed (to "trap" the printing). The glassine permits the foil to show through, and it covers any pinholes in the foil. Combined in this case are good properties of all three materials.

4. Foil, paper, foil, and poly coating. Here foils serve both as moisture barriers and decorative media for this strong, heat-sealable material.

5. Tissue, foil, and poly coating. Tissue does not add strength to the composite material. It may be replaced with a heavier pouch paper when the paper doesn't have to take a good print job.

6. Gravure paper, foil, and poly coating. This provides a good printing paper, along with the protective properties of foil and polyethylene, plus heat-sealability.

7. Paper (bleached and unbleached kraft pouch and gravure type papers) and poly coating. This combination provides heat-sealable wraps with opacity derived from papers instead of foil.

8. Glassine coated with poly is still another example.

POLYETHYLENE LAMINATIONS

Here are examples of combinations using polyethylene as a laminant:

1. Cellophane, poly, and cellophane.
2. Mylar, poly, and Mylar.
3. Paper, poly, foil, and poly.
4. Foil, poly, paper, and poly.
5. Foil, paper, poly, foil, and poly.
6. Foil, poly, foil, and poly.
7. Cellophane, poly, foil, and poly.
8. Paper, poly, and foil.
9. Glassine, poly, and glassine.

BETTER PAPERS ARE BEING MADE

Improvements in the manufacture of food-packaging papers continue:

Better pulpwood is being produced through forestry research. Brighter, stronger grades are being achieved by new cooking, bleaching, and other treatments.

Advances in paper-making techniques are adding better properties. For example:

Water repellency is being increased by adding stearato-chromic chloride.

Grease resistance and water repellency are improved with chromic fluoride.

Greater strength and flexibility are imparted by resins and latexes.

Smoothness and slip properties come from introducing wax emulsions.

Sticking of product to package is being curbed by treating papers with releasing agents like silicones and stearato-chromic chloride.

Quality-control programs are being set up in the plants to produce better, more uniform papers. Labs are even staffed with organoleptic testers. And papers are more precisely manufactured to adhere to users' specifications.

Printing properties have been improved. Advanced techniques call for better finishes.

Vinylidene chloride (Saran) and vinyl chloride copolymers rank next as paper coatings. These plastics are grease and gas resistant. Saran is outstandingly resistant to moisture and moisture vapor.

Vinyl-coated milk cartons and vinyl- and Saran-coated paper cap liners are widely used.

HARD KEEPING UP WITH THEM

Significant developments in plastic films are foreseen.

New and improved films will continue to be made by blending many different resins and resinous plasticizers to produce a wide variety of properties. The trend appears to be away from solvent casting to production of lower cost films by extruding or calendering.

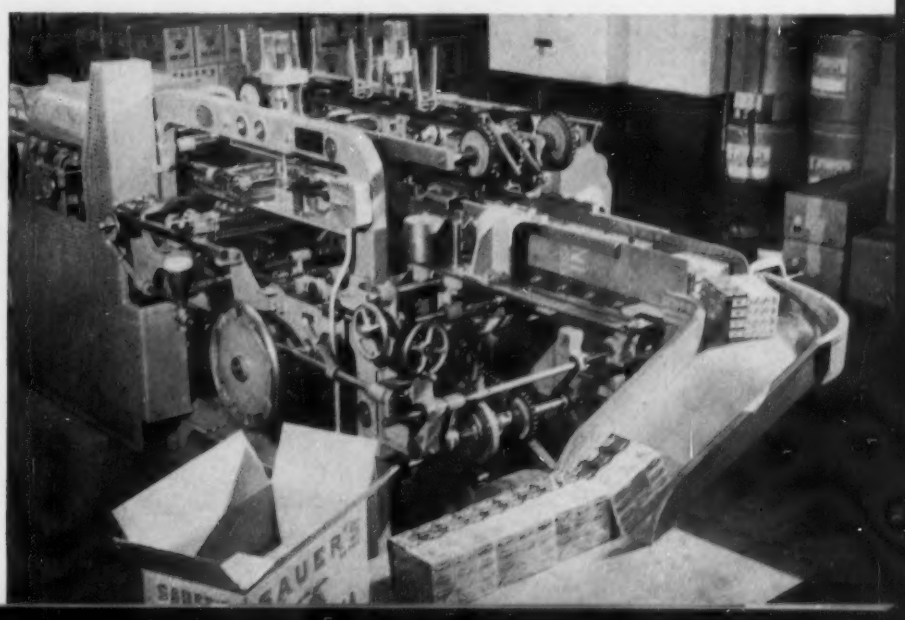
There's a lot of activity in the development of still lower cost extruded films produced without drying and through use of special solvents.

Plastic films will be oriented to give them more footage (greater film-area yield per pound of resin) and new properties. Pliofilm, for instance, is two-way stretched (while being made) from a 40- to 20-gage film for more economical use in laminations.

New and improved non-toxic plasticizers will go into film formulations.

Also of interest to plastic-film users is a "locked-in" printing technique, giving a printed surface that's not exposed to abrasion. The process involves laying ink between two plies of transparent film.

New flexible packages are coming thick and fast. Most exciting is the polyester film, Mylar. Right now,



STRONG MYLAR polyester film is first of the transparents employed for the heavy bundling jobs. Seen is 12-carton wrap-up of vanilla extract on modified machine. Besides high tensile strength, film offers clarity, impact resistance, and insurance against tearing and puncturing. Sealing problem has been licked by combination of heat and benzyl alcohol.

only a small amount of its total production goes into packaging. But because of its interesting properties, wide food applications—some unusual—are foreseen.

MYLAR'S BIG POTENTIALS

Alone, Mylar offers sparkling clarity, high tensile strength (one-third that of steel), impact resistance, thermal stability, dimensional stability, chemical resistance, crisp appearance, and good protection against ultraviolet light. It provides added insurance against tearing, puncturing, or other damage in handling and storing.

Mylar has been adopted—on the basis of its clarity, durability, and high-strength—for bagging apples, macaroni and other products. It is used in window-type cartons. And it is employed for bundling weighty carton-packed items like vanilla extract.

Mylar's inability to heat-seal on standard tray-overwrapping and bundling machines has recently been licked by the use of a combination of heat and solvent (benzyl alcohol).

The new heavy-bundling technique is the first to use transparent film. The other transparents lacked the right strength. Use of this polyester film for foods is growing because the combined solvent-heat sealing permits it to be handled on standard, high-speed wrapping machines.

Next year, du Pont is expected to make heat-sealing even simpler by introducing a waxed Mylar.

Bonded to 150 to 200-gage polyethylene by a special adhesive, Mylar is fabricated into a pouch to check greening in gas- or vacuum-packed sliced luncheon meats and frankfurters. This material also protects air-sensitive products like cheese.

In addition to Mylar's unusual properties, this lamination offers heat-sealing and chemical-resistance, plus good aging and excellent low-temperature properties.

New poly-coated Mylar should open a host of possibilities in food packaging. It can be handled on standard package-making machines without troublesome static pickup.

BOIL-IN-THE-BAGS

Attention has been attracted by the Mylar-poly combination serving as a boil-in-the-bag package for certain frozen foods. Look for the use of such bags in packaging edible oils, oily foods, and a variety of meat-containing products—stews, beef goulash with noodles, spaghetti and meat balls, Salisbury steak, and Swedish meat balls in sauces, tamalies, etc.

These bags resist greases and temperatures in the —80 to 300F. range, and they have low permeability to moisture-vapor gas. An abrupt shift from freezing to boiling water does not affect them.

With such a package, the preparation of pre-cooked food is extremely simple. A bag is removed from the refrigerator, boiled for 12 min., cut open, and the hot food served. For variety, three different entrees can be boiled in the same pan.

Other boil-in-the-bag materials:

Special aluminum envelopes. Cocktail shrimp (cleaned and peeled) are being packed in them to be boiled in the package.

Polyethylene-coated Saran-cellophane guards frozen foods against oxygen deterioration and moisture-vapor losses. Poly supplements the desirable properties of Saran and cellophane with its rigidity and heat-sealing characteristics.

A poly-coated foil-sulfite paper lamination safeguards products against light, moisture, and gas permeability. This stiff, heat-sealing composite has an excellent printing surface.

Being researched is a combination with great potential —foil plus Mylar, in which each material excellently complements the other.

For use where transparency is not a factor, this combination affords great strength, durability, insect resistance, and good gas- and vapor-permeability. By using a heat-scalable coating, it could also be made into pouches.

Work is also in progress on the development of heat-shrinkable Mylar bags.

Just out is Minnesota Mining & Mfg. Co.'s new super-tough (15 lb.-in. tensile strength) heat-sealable polyester film. Seal, in fact, is as tough as film itself. Film has such a wide temperature tolerance that it can be used to package hot pre-cooked foods for sharp freezing. Or foods can be packaged fresh, quick frozen, and cooked in boiling water in the package.

Fastest growing plastic material, and runner-up, volume-wise, to cellophane, is polyethylene. Perhaps no other plastic is so versatile for changing by various

HEAT-IN-THE-BAG products — in this instance squash—utilize sacks made of Mylar. And current tests are seen expanding the varieties of farm-fresh washed and pre-trimmed vegetables so packed. Bagged sauerkraut is one new item coming up in the popular right-to-the-pan convenience group.

PRODUCT NEWS FROM Pfizer

Now, Two Cost-Saving F. & D. A.-accepted Plasticizers

for cellulosics...

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(Acetyl Triethyl Citrate)

The Food and Drug Administration has now accepted CITROFLEX A-2 for use in plastic food wraps—like the cellulose acetate food packages you see here. Non-toxic and odorless, CITROFLEX A-2 is accepted *for both fatty and non-fatty foods.* Most important to you, the cost of this citric acid ester is remarkably low, compared to other nontoxic cellulose acetate plasticizers.

for polyvinyls...

Compare PFIZER CITROFLEX* A-4

(Acetyl Tributyl Citrate)

CITROFLEX A-4 is also nontoxic, odorless and accepted by the F.&D.A. for use in plastic packaging of *either fatty or non-fatty foods.* You can use CITROFLEX A-4 to plasticize vinyl films for meat wrapping...vinyl coatings for food containers...vinyl plastisols for bottle crown liners, food jar sealing rings and "safe teething" vinyl toys. Compare the cost of efficient CITROFLEX A-4 with other *F.&D.A. accepted* vinyl plasticizers.

Besides A-2 and A-4, the Pfizer CITROFLEX line includes CITROFLEX 2 (Triethyl Citrate), CITROFLEX 4 (Tributyl Citrate) and CITROFLEX A-8 (Acetyl Tri-2-Ethylhexyl Citrate). Check into the Pfizer CITROFLEX plasticizers today. Mail the coupon below.

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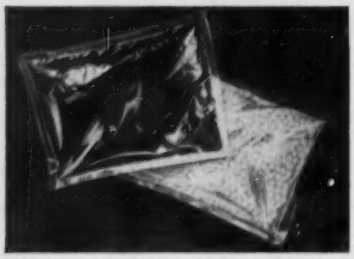
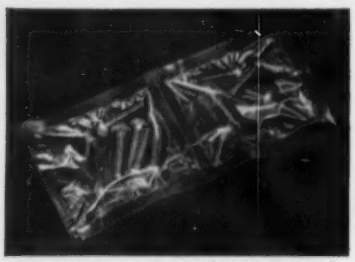


ACIDS or volatile chemicals can be packaged easily, handled safely, shipped without fear in heat-sealable containers of new "Scotchpak" Polyester Film. Also lines drums and cartons.

FOOD ITEMS are packaged safely in clear-as-glass "Scotchpak" Film. Contents can be frozen . . . even boiled *right in the package*. Low gas penetration rate . . . inert and non-toxic.



METAL PARTS can be packaged dry or in oil or grease to protect them against corrosion. Transparent packages are easy to handle, easy to ship and to store. Simplifies issuing of parts and units.

FREE FOLDER shows dozens of ways you can solve your most difficult packaging and shipping problems with new "Scotchpak" Polyester Film. Just write on your letterhead: Film Products Group, 3M Co., St. Paul 6, Minn., Dept. CH-116.

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special treatments and manufacture to broaden its range of applications in packaging food products.

BIG STRIDES OF POLYETHYLENE

It is compatible with certain other plastics, and may be compounded to extend its usefulness. Additives like resinous waxes, butyl rubber and S-polymers form it into films with better moisture-vapor and grease resistance.

Opposite heat-shrinkable polyethylenes are those that are extrusion-oriented to make them stretchable. Bags from such materials "cold-stretch" so products can be packed into them in a skin-tight fit without immersion in hot water. Pinhole-free tubing—valuable for packaging liquids—is made from this material.

Other new skin-tight films are heat-shrinkable oriented Pliofilm and stretchable vinyl nitrile. The latter is a modified version of the vinyl film developed about 8 years ago as a margarine-color squeeze bag.

New and different polyethylene resins of the low-, intermediate-, and high-pressure types are being made through selection of catalytic compounds. A large variety of properties—to fit food-packaging needs—can be tailor-made to produce polys in the 0.880 to 0.990-density range. High-pressure polys fall into the low-density range, and low-pressure polys into the high.

Gradual increase in the density of poly brings about such changes as greater tensile strength, better gas transmission, lower impact resistance, poorer clarity (more internal haze), and lower moisture-vapor transmission.

Low-pressure polys are now being extruded into films. And work is progressing on poly-coating of paperboard.

Also keep an eye on polypropylene—a new Italian plastic. Made by a low-pressure process employing propylene gas and complex catalysts, this plastic soon may compete with polyethylene. Reportedly, it is clearer, cheaper, and more heat resistant than polyethylene, while lacking its "waxy" feel.

The basic material, propylene, is cheaper and more readily available than poly's raw material, ethylene. Hence, this new plastic should be low in cost.

And there's a new polyethylene resin with a higher crystallinity than present resins. This property provides increased clarity, surface sparkle, and stiffness, along with reduced permeability.

Irradiation techniques are being used to alter the properties of plastic films—such as stiffness, higher heat resistance, and improved chemical resistance.

Irradiated polyethylene (Irrathene) is a new plastic created by bombarding poly with high-energy electrons. And it has intriguing possibilities. The non-melting polyethylene film shrinks under heat to produce a tight, tough, form-fitting wrap.

Irradiation treatment raises the heat resistance so the poly doesn't fall apart at 250F. The material possibly could find application as a bag for thermal sterilization of foods. Along with Mylar, it's being looked into as a can liner.

But cost and odor problems must be overcome.

KEEP AN EYE, TOO, ON SARAN

Although not a new material, interesting things have been done with Saran. On a gage-for-gage basis, its moisture-vapor resistance is almost five times higher than any other self-supporting film.

COLORFUL and protective ½-lb. coffee package is made from gold-colored glassine, foil, and cellophane. The laminated bag is square, with a self-opening bottom.

The new Saran film was developed for food packaging soon after the war and was enthusiastically received on the basis of its sparkle, crystal clear transparency, extremely low gas permeability, toughness, aging characteristics, self-clinging properties, and chemical resistance.

This film fits into the heat-and-eat food field, as mentioned, because it withstands temperatures exceeding boiling for over an hour.

Drawback is sealing. But manufacturers are getting around this problem. Dielectric sealing is being used, for the most part. A Mylar-Saran lamination seals on hot bars. Heat-sealing combinations consist of Saran as a lacquer applied to such base films as polyethylene, Pliofilm and cellophane (du Pont's K-202 and Olin's OX 511).

Saran-coated Mylar might supplement tin, maybe even eliminating certain can lacquers.

But this combination tack-seals and won't hold a vacuum-seal like a cellophane-polyethylene pouch. However, apply polyethylene to Saran-coated Mylar, and the composite has polyethylene's sealing properties, Saran's proofness to gas and moisture vapor, and Mylar's strength.

Saran film has gone into cap liners for glass jars or

bottles used for such oil-containing products as mayonnaise, salad dressing, and French dressing. It is laminated to calendered newsboard to give the liner exceptionally low moisture and gas transmission, plus good resistance to chemicals and grease.

Saran is also laminated to cellophane, polyethylene, aluminum foil, and all types of paper to produce materials with a wide variety of properties.

Search goes on for new paper-making fibers—glass and also the synthetics like Nylon and Orlon.

Experimental synthetic paper now made from Nylon fiber is almost like Mylar, since it's just about impossible to tear by hand. And it's many times stronger than papers produced from rags or wood pulp. Its application will be in heavy-duty bags.

VINYL FILMS

Under consideration are new and improved ways of producing cast vinyl to meet the demands of the packaging field. Undoubtedly, this will result in greater use of this material in packaging.

In cast vinyls, the quantity and type of plasticizer, as well as the finished gage, affect the properties of any given type. Some types are non-toxic, and so can be used in contact with food. But cast vinyl is used principally as a lamination to other packaging materials.

Worth watching is unplasticized vinyl. It's rigid, thus lends itself to vacuum forming to fit irregular-shaped food products.

It was only a few years ago that polyvinyl chloride film was successfully extruded. This film has many of the desirable properties of the cast film, along with production economies.

Protective properties of extruded vinyl vary a little with type and gage. Significant, however, is its excellent resistance to sunlight and aging. As yet, it has not been government-approved for direct-contact food packaging.

Inviting attention is vacuum-forming of vinyl in rigid sheet form. Examples are the single portions of jellies, syrups, etc., put up in cups vacuum-formed from rigid vinyl sheeting and top-sealed with transparent vinyl film.

Another vac-formed package is the bubble pack (Skin-Pak). Here, a transparent shell is closely made to product shape. Then the product is placed in this shell, which is then glued or heat-sealed to a card.

Some non-rigid cast vinyl film is being vacuum-formed, on a test basis, for moldable food products like butter, ice cream, and gelatin desserts.

THE POLYSTYRENES

Available are two types of polystyrene films. One is an unoriented, high-impact, extruded sheet offered by a large number of suppliers. The other is a biaxially oriented film produced by a few manufacturers.

Polystyrene films are oriented to make them clear, stronger, and more flexible. Unoriented films are extremely brittle, and almost useless for packaging.

Oriented films stand up best against irradiation. They don't develop off odors, lose tensile strength, or degrade. Nor does the heat seal give away.

Interesting work is also underway in forming roll-fed, oriented 5-mil-thick polystyrene into transparent frozen food trays with a 5-mil thick cover. The film contains no plasticizer, and withstands subzero temperatures without shattering.

Polystyrene's high gas permeability suggests its possible use in the packaging of fresh produce and meats. And limited tests for such applications are underway.

This film also should find food-field uses because it is greaseproof, odor-free, and non-toxic.

Styrene acrylonitrile copolymer is also biaxially oriented to provide it with flexibility, better weathering characteristics, and chemical resistance.

FLEXIBLES USED IN CARTONS

Improvement in the laminated construction of cartons show much promise. Until recently, most cartons were wax coated. But the fragile, coated surface scuffed and cracked.

Flexibles—laminated to cartons—should play an increasing role. These make containers which will hold oils, brines, syrups, and fruit juices without leaking.

Trail-blazers are poly extrusion-coated and one- or two-side foil-laminated cartons that are moisture- and grease-resistant.

The foil combination can be opened to form a rigid, spill-proof, "heat-in" carton. The housewife can pop it into the oven, with assurance that it will resist baking temperatures over 400F.

Such packages are ideal for Brown 'n' Serve and other rolls. They're a cure for such baking headaches as greasing and cleaning metal pans. No depanning is required—they're just overwrapped and sold.

What a foil-paperboard combination lacks may be made up for by Mylar laminated to board. It could replace foil, where salt and corrosion are factors.

Poly-coated paperboard will compete with other materials to provide greaseproof boards. Reason is that the extrusion-poly-coating technique has overcome certain gluing and handling problems common with other laminated paperboards.

MACHINES AND MATERIALS

Some materials—like Saran, Mylar, and cellulose acetate—could not have found extended applications except for the development of machines to overcome their heat-sealing deficiencies.

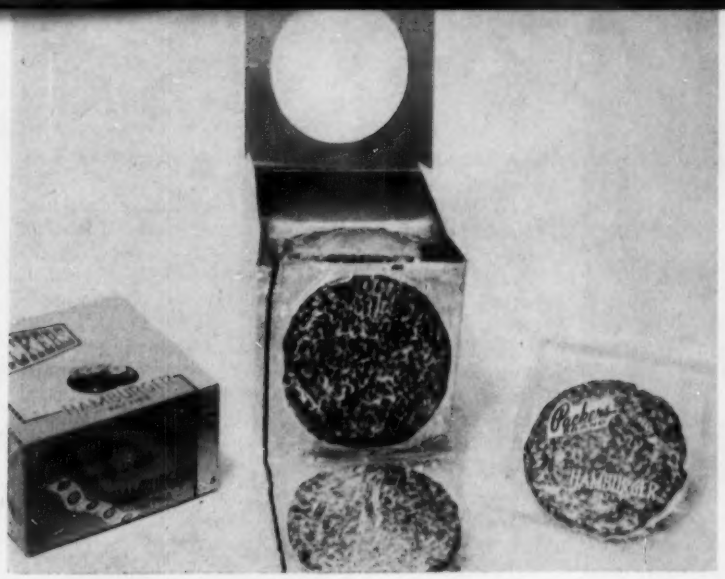
Efforts will continue to step up speeds on carton overwrapping machines from the present 200-250 per min. to over 400. Machines will be of the continuous-motion type, with fewer moving parts and better control of free-flowing sheets.

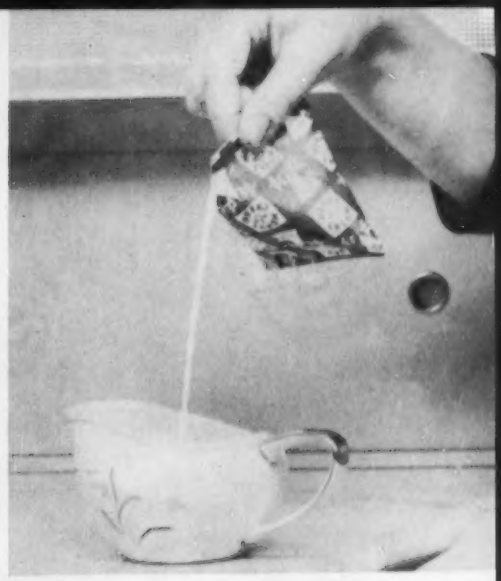
Tendency is away from the use of preformed single pouches. Instead, pouches are being fabricated from roll-stock, filled, evacuated (or gassed), and heat-sealed.

Newer thermoplastic materials will instantly set up upon heat sealing. They'll withstand wider heat-sealing ranges—perhaps as much as another 100 deg.

Making headway are straight-line, multi-function machines that are turning out portion-controlled packets. They're forming pockets from heavy-gage vinyl sheet, then automatically filling them with small portions (enough for individual servings) of mustard, ketchup, sauces, jams, jellies, and syrups. A thinner, roll-fed vinyl sheet is then sealed over the filled pockets.

Free-flowing solids are portion-packaged in a similar manner. They're volumetrically fed into roll-fed, machine-stamped foil pockets at over 700 per min. Then thin film is similarly sealed over the multi-pockets, and these are then machine-stripped into individual packets.





INNOVATIONS reflect design ingenuity. Left: Strip-type, multi-pouch package accents convenience, protection. This one carries hamburger patties. Tear-tape is included for removing individual servings. The rest remain pouched until needed. Right: The new Tetra Pak container is formed from rolls of paper coated with heat-sealing polyethylene. A saver of plant storage space, it can be made in sizes ranging from an individual "creamer" to a quart milk container. Size here is ½-pint used by Sunrise Dairies, Hillside, N. J., for heavy cream.

NEW PACKAGES Appeal, Simplify

Spotlighted are attractive, protective, coated wraps . . . Glassine combinations . . . New plastics coming up . . . Tight fits . . . Portion items . . . Opening and closing features

FLEXIBLE PACKAGING is heading into a decade of major expansion—if recent food-industry applications can be used as a barometer.

New applications are coming thick and fast. And they'll be adapted to more highly mechanized lines.

One new attention-arousing frozen food package is a combination foil-lined carton with a polyethylene-wax coated overwrap. This ovenproof, liquid-tight carton is designed so that sauce- or gravy-containing pre-cooked foods can be heated in it with no pots to clean.

The single-piece carton consists of 0.014-in. bleached paperboard laminated to 0.00045-in. lacquered aluminum foil.

POLYETHYLENE-WAX-COAT WRAP

Eye appeal is built into the overwrap by a new wax coating formulated with low-molecular weight (about 2,000) polyethylene. The wrapper's print-reproduction of a top-quality colored photo of an heat-and-eat pre-cooked food looks quite realistic.

The color printing looks deeper and richer. And the high-gloss coating is extremely hard, more scuff-proof, and resistant to low-temperature cracking.

This wrapper handles more smoothly on automatic machines than do other waxed wraps. That's because blocking point is up to 20F. higher, and heat-sealing temperatures run about 50F. higher to produce excellent sealing strength. What's more, surface friction is lower, and there's less coating rub-off on machinery.

Butter and bread wrappers are also coated with wax-containing low-molecular polyethylene to add eye appeal, gloss, and rigidity, and to fortify against handling.

Some food processors have gone to sales-appealing, gravure-printed foil wrappers.

GLASSINE COMBINATIONS

High-density and grease-resistant glassine and greaseproof papers are ideal as bases for such conversions as waxing, lacquering, hot-melt coating, polyethylene coating, and wax laminating. And such conversion techniques can be controlled to offer a wide range of improvements in strength, heat-sealing, and moisture-vapor resistance.

Interesting new combinations include:

1. Foil-and-glassine laminated liner for carton-packed dry breakfast cereals.
2. Polyethylene-coated glassine pouch for cake mix, and a glassine-foil pouch with heat-seal poly coating for

BULK-LIQUID BAGS of polyethylene are used to contain cream which is shipped inside corrugated cases. This innovation saves shipping weight of metal cans, eliminates can washing operation.

egg-white mix. Both printed pouches are carton-packed to make up an angel food cake mix package.

3. Printed, high-gloss, polyethylene-coated pouch paper (outside) laminated to foil (inside) for dehydrated soup mixes.

Polyethylene bags have been made to shrink. Filled with meats or poultry, evacuated bags contract 30% in both directions when dipped a few seconds in 215F. propylene glycol solution.

Cooked ready-to-eat smoked beef tongues are vacuum-packed in Cry-O-Vac bags. Wet, brine-pumped corned beef is form-fit packed in these leakproof, shrink-type bags, to cure in the bag and save costly curing-cellar space.

The new bagging technique also improves quality, marketing, and handling of the cured beef—lowers costs and expensive moisture losses, too.

PLASTICS COMING UP

At random, here are some of the new striking developments—spotted at different stages from initial concept and trial to actual use:

. . . **Vacuum-formed plastic inserts**—of semi-rigid cellulose acetate, polystyrene, etc. They would be put into cartons as suitable backing for frozen meats like T-bone steaks or used to tray-pack delicatessen items, like trays of foods for serving purposes.

. . . **Heat-formed packages**—like those now fabricated from polyethylene for packaging fish fillets.

Getting attention, too, are high-impact or oriented polystyrene and cast vinyl, acetate, and butyrate sheets. And look to future use of other plastics (like polyester, low-pressure polyethylene, methacrylate, ethyl cellulose, etc.) as materials for heat-formed packages.

. . . **Blister or contour packs**—using vacuum, or pressure-forming plastic sheets around products (or preformed in mold). They may challenge cans or glass containers because of economy and wide application. And they might assume a role with paperboard, as have plastic films with papers.

. . . **"Therimagraphy."** This involves a decal-like, transfer-printing combining printing and labeling through use of heat and pressure and a specially designed machine. Unit transfers three-color, paper-backed labels onto cellophane. Look for future applications to other films, papers, and containers.

. . . **Printing-laminating technique**—for multi-colored, chub or link packaging of liver sausage and similar items. Example: Two layers of Saran (100x100 gage) laminated with special adhesive. Rotogravure-printed inside surface of outer ply is locked between the two sheets. This gives two-ply wrap greater tensile strength.

. . . **Vacuum packaging** of sliced luncheon meats, using the canning technique of all-metal containers, but substituting Saran for most of the metal. Leaving only a metal base, this is perhaps the nearest thing to a "transparent and flexible can."

. . . **Duplex bags** comprising printed cellophane and glassine. They are designed to step up bagged coffee shelf-life four times. Bags are formed as fast as 40 per min. from roll stock, then filled and sealed.

. . . **Bag-in-the-carton "shipper."** This economically abolishes 5- or 10-gal. metal cans for shipping cream from farms to dairy plants. Lightweight package contains four polyethylene bags (3 mils thick), each holding 10 lb. of cream and packed into a corrugated carton.

. . . **Frosting in a bag.** Contained in transparent plastic material, icing is packed along with Brown-'n-Serve un-iced bakery products. To apply, corner of heat-sealed bag is snipped off, then bag is squeezed.

PLASTIC-FILMED EGGS

. . . **Shell-less eggs.** After taking from shells, eggs are dropped into a dozen cup-like compartments. These cups are CO_2-purged (to protect egg quality), then they're top-sealed with plastic film.

. . . **Strip packages.** These are likely to appear for such products as frozen meat patties, along with convenient tear tape.

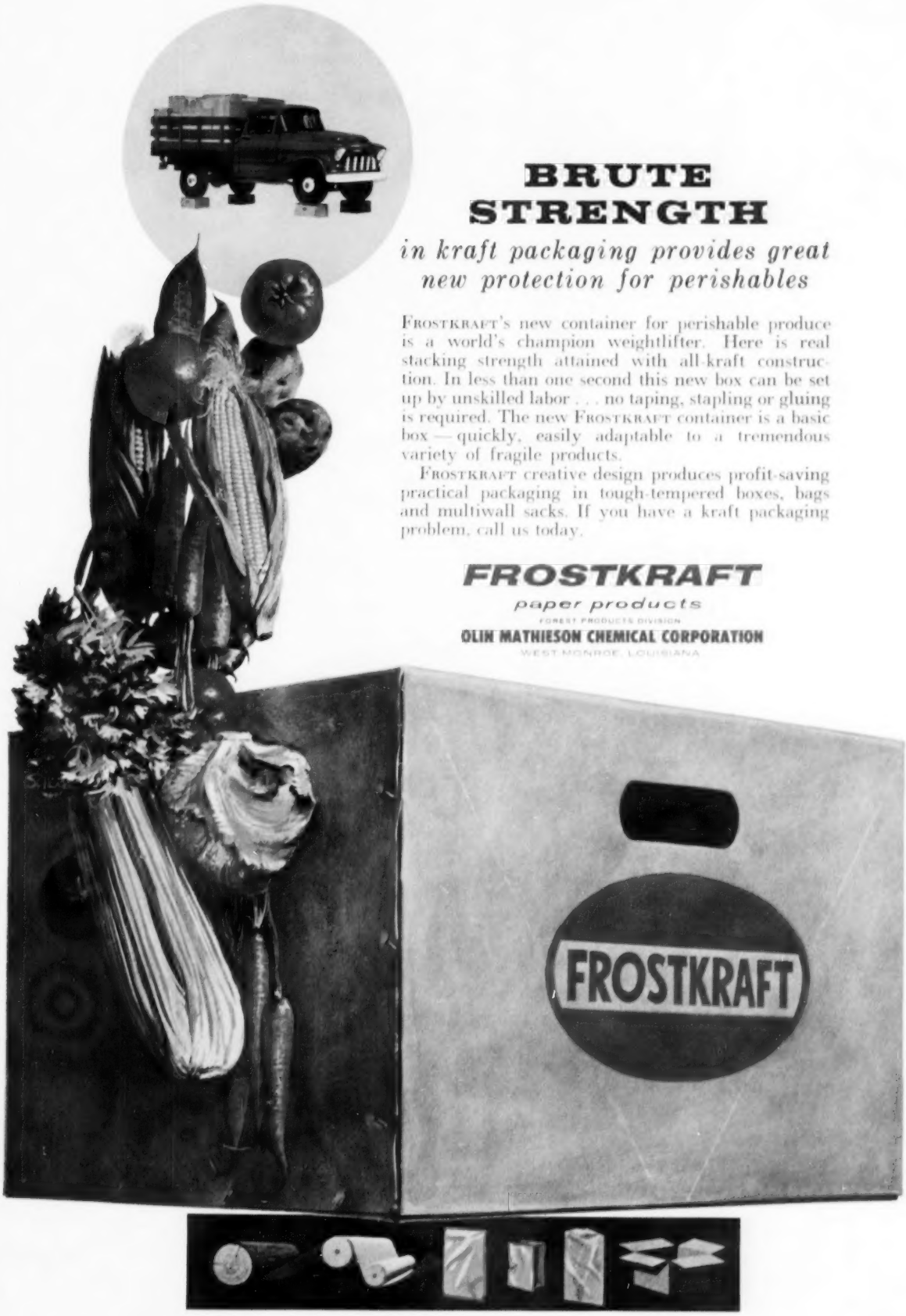
. . . **Stew combination**—made up of mixed vegetables in a cellophane bag and a small tray of cellophane-wrapped stew meat, with both items packed on a large paperboard tray and wrapped in cellophane.

. . . **Fractional packages.** Since most recipes call for a maximum of one cup, the product remaining in a package is likely to stale or deteriorate. Here, need for measuring is eliminated by offering several bags containing cup portions—as of rice or brown sugar—within a larger outer bag. This would especially simplify the use of brown sugar, which when solid packed tends to harden, so that it must be "hammered" out.

. . . **Other items in fractional packages**—such as crackers, popcorn, potato chips, marshmallows, sundae toppings, soy sauce, instant coffee, nut meats, concentrated frozen lemonade and orange juice.

. . . **Possible fractional wrap** would be multi-pack containing units of 4, 6, or 8 slices of bread for smaller families. Unit packages would prevent costly throw-away of stales.

. . . **Disposable pouch.** Used for individual portion of soy sauce, it features controlled-flow spout. Partially slit to facilitate opening, top of transparent pouch is easily torn off to expose mouth of spout. Held downward, pouch is gently squeezed and sauce is ejected in a narrow stream. Release of pressure stops flow.



BRUTE STRENGTH

in kraft packaging provides great new protection for perishables

FROSTKRAFT's new container for perishable produce is a world's champion weightlifter. Here is real stacking strength attained with all-kraft construction. In less than one second this new box can be set up by unskilled labor . . . no taping, stapling or gluing is required. The new FROSTKRAFT container is a basic box — quickly, easily adaptable to a tremendous variety of fragile products.

FROSTKRAFT creative design produces profit-saving practical packaging in tough-tempered boxes, bags and multiwall sacks. If you have a kraft packaging problem, call us today.

FROSTKRAFT

paper products

FOREST PRODUCTS DIVISION

OLIN MATHIESON CHEMICAL CORPORATION

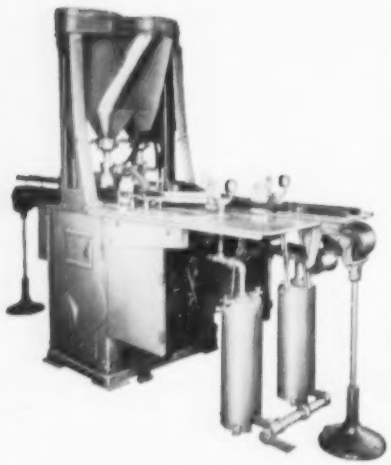
WEST MONROE, LOUISIANA

4 ways to protect your profits in packaging

with accurate dust-free filling

1

Stokes & Smith Model EG-1
Universal Auger Filling Machine



Semi-automatic operation with any of four filling methods... volumetric, pressure packing, gross weighing, or Auger-Vac. 40% fewer working parts are all located above filling station for clean operation. Will accommodate a wide range of package sizes from 2 grams to 10 lbs. at speeds up to 30 units per minute.

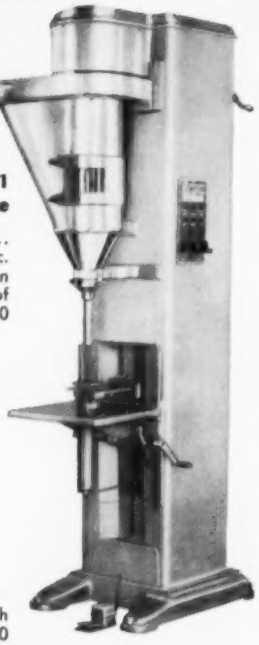
Ideal for Dry Milk Solids

2

Stokes & Smith Auger-Vac assures clean, accurate fill with minimum dusting loss of whole or non-fat dry milk solids, hot chocolate powder, cocoa, instant coffee, etc. in cans or jars.

Stokes & Smith Model HG-84
Automatic Duplex Filling Machine

Two filling stations operate automatically by auger feed with precision cam-control for accurate filling. Speeds up to 60 units per minute. Also supplied with Auger-Vac equipment for fast, dustless filling of non-fat dry milk solids and other hard-to-pack powdered products.

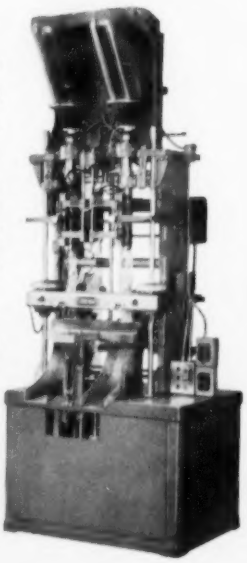


with fast, flexible packaging

3

Stokes & Smith Model "BS"
STOKESWRAP Machine

From roll stock, automatically forms, accurately fills a wide range of powdered or granular products and heat-seals either pillow-type or four-seal package. Handles a wide variety of packaging films at speeds up to 120 units per minute. Ask about STOKESWRAP for non-fat dry milk solids, dry cream, etc.



with contour wrapping

4

Stokes & Smith STRETCHRAP Wrapping Machine

Cheeses, meats and other odd-shaped products are wrapped at speeds of 12 or 15 units a minute in clear, sanitary, air-tight Pliofilm.* Reduces spoiling, handling damage, moisture loss. Tight wrinkle-free "skin" makes sales-appealing package.

**T.M. The Goodyear Tire and Rubber Co., Akron, Ohio*

STOKES & SMITH CO.

4914-N SUMMERDALE AVENUE, PHILADELPHIA 24, PA.

Pacific Coast: SIMPLEX PACKAGING MACHINERY, INC., 534–23rd AVE., OAKLAND 6, CALIF.

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SUBSIDIARY OF FOOD MACHINERY AND CHEMICAL CORPORATION

PROGRESS IN FLEXIBLES is reflected in these two types of packages. The pouch for an individual serving of cream (left) is a transparent, heat-sealing lamination of cellophane and polyethylene. The "chub" items (right) are in clear, highly moisture-impermeable Saran, and are efficiently formed, filled, and clip-sealed on a continuous machine.

. . . **Snack chip-dip powder** is pouch-packed in a printed, high-gloss foil-polyethylene material, then added to milk and whipped by housewife.

. . . **Ready-to-make popcorn** is put up in a circular foil pan fitted with a folding cardboard handle and a thin-gage lid that expands with the popping of the corn.

. . . **No-bake pie mix.** This is a new summertime convenience item consisting of individual pouch-packed crust and filling mixes, both put up in a carton. Housewife just mixes, chills, and serves.

. . . **Frozen barbecued sandwiches.** They may be heated in their aluminum foil wrappers, or simply thawed and eaten cold.

. . . **Non-glazing method** of packing frozen shrimp, fish, poultry, meats, etc. Waxed carton and over-wrap combination curbs moisture loss and water leakage, saves on extra storage space, shipping weight.

. . . **Ready pancake mix** now appearing in single-portion pouches machine-made from roll-fed, printed, polyethylene-coated paper stock.

. . . **Salted mackerel fillets** brine-packed in a strong pouch made up of reverse-printed cellophane laminated to heavy-gage polyethylene.

. . . **Home dispenser.** This serves as a "penny-gum machine" for 50 sticks of wrapped gum packaged in dispensing-type carton.

. . . **Instant cake-frosting mixes** pouch-and-carton packed. They need no cooking, only adding of water and whipping.

. . . **Triplet package** is polyethylene bag into which is packed three cartons of frozen foods to make up a dinner for three. In one case, package consists of carton-packed fish stick, frozen French fries, vegetable.

TIGHT-FITTING PACKAGES

. . . **Skin packaging of cheese** in pliable Saran that conforms tightly to cheese shape and prevents drying out of product.

. . . **Combination packages.** Examples: Noodles, macaroni, and spaghetti, each separately packaged in printed transparent bags. Dessert comprising individually cartoned ice cream, frozen sliced strawberries, and shortcake (all overwrapped with printed film bags). Foil baking pan with a windowed cardboard lid containing vacuum-sealed polyethylene-cellophane bags of pie crust, sliced cheese, grated cheese, and tomato sauce.

. . . **Rindless cheese pack**—as Provolone now put up in Cry-O-Vac bags.

. . . **Divided polyethylene-cellophane pouch**—separates cooking oil (in stick form) from salted popping corn.

. . . **"Cook" package**—consists of an aluminum foil wrap for steaks, chops, etc., that can be unwrapped to serve as a grill.

. . . **Roast-in-the-wrap**—consists of an extra heavy color-printed aluminum foil, in which poultry, meats, etc., are roasted.

PACKETS of seasoning included in spaghetti dinner are envelopes of aluminum foil. These convenient flexible containers are used for line of 6 mixes from which consumer makes spaghetti and macaroni sauces.

INDIVIDUAL PACKETS of salt and pepper, made of cellophane laminated paper, were developed for a lunch box marketed by Durkee Famous Foods, Cleveland. Bags are contained in a twin-window carton.

. . . **Flexible glassine cushioner.** This is made in single or multiple sheets, plain or printed and of a variety of colors, by a new process employing heat and pressure to permanently crimp glassine fibers. Though flexible, material is rigid enough to absorb shock and curb breakage of confections in top layers of cartons.

. . . **Perforated wet-strength bags.** These are for ice packing fresh sweet corn so as to keep its sugar from changing into starch while enroute from farms.

PORTION PACKAGES

. . . **Separate cheese slices** are now automatically sealed in a continuous strip of film, with perforations for easy portion-separation. Folded accordion-style, slices may be banded with printed colored-film tape.

. . . **Portioned beverages.** Here, a carton contains three pouches of instant non-fat milk solids or instant chocolate milk. Product in each pouch re-constitutes into a quart.

. . . **Dual-use product** is put up in portion-controlled packets, machine-formed from printed stock. Specific item can be used as confection or water-soluble fruit beverage.

. . . **Individual sugar servings** in polyethylene-coated paper packets. Safeguards product from moisture and contamination.

. . . **Make-it-yourself dressing mixes.** They are packaged in colorful, laminated-foil envelopes within a paperboard kit, along with mixing bottle. Housewife simply blends mix with oil, vinegar, and water.

. . . **Colored-polyethylene.** Hues lend attractive touches to foods that don't require visibility as a sales feature.

. . . **Self-measuring shortening dispenser.** This consists of a tube with tear tape fitted inside three sides of container. Pulling of the tape extracts shortening.

. . . **"Tetra-Pak"** the Swedish developed pyramid-shaped container of polyethylene-coated paper. Formed from roll-stock and machine-filled, it is cited as a cost saver in packing single servings of milk, fruit juices, and soft drinks. Same package, but in smaller size, is also adapted for single-portion servings of honey, jam, dressings, ice cream, etc.

. . . **"Do-it-yourself" kit** containing a can of blueberries, a polyethylene-coated glassine pouch of muffin mix, and ten parchment muffin cups.

. . . **Cake mix.** Here, a burnt sugar combination is put up in a heat-sealed polyethylene envelope, along with cake mix in a glassine bag glued within the carton.

. . . **Pizza pie mix** consists of pizza flour in a glassine-polyethylene bag, active dry yeast in a cellophane-foil-polyethylene pouch, sauce in a metal can, and grated cheese in another can. All four packages are carton-packed.

. . . **7-in-1 package** which comprises:

(1) and (2) Bread mix packaged in two kraft-glassine laminate bags.

(3) and (4) Active dry yeast in two nitrogen gas-packed foil-acetate-Pliofilm laminate pouches.

(5) and (6) Garlic powder and sugar-cinnamon mix in separate kraft-foil-Pliofilm laminate pouches.

(7) An aluminum-foil bread pan.

All seven items are put up in a folding-type carton. Here, consumer can bake a variety of breads—plain, garlic, or cinnamon.

. . . **Coming:** A 1-gal. paperboard milk container with inner rectangular-shaped polyethylene bag containing a built-in pouring spout. Carton is constructed to resist scuffing, abrasion, and rough handling.

. . . **Possible:** Infrared-cooked bacon strips packed 6 or 8 to a foil pouch for easy popping in a toaster (package and all).

. . . **Look for:** Sliced bacon overwrapped with Pliofilm containing a tear tape, as well as Pliofilm for "cook-in" products.

. . . **Also on the way** is packing of a variety of entrees in "heat-in-the-bag" Mylar polyester film, to be offered to bars and other places with limited kitchen facilities.

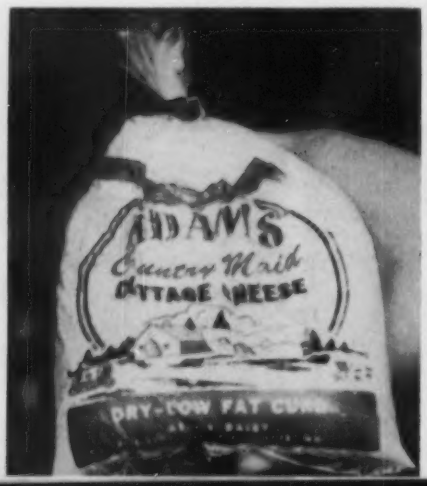
. . . **Extension** is seen of "cook-in" Mylar bags to other pre-cooked foods, sauerkraut, washed and pre-trimmed vegetables like squash, fresh or frozen corn on the cob, and sweet potatoes.

. . . **Special foil wrap** treated with a volatile antioxidant to prevent oxidation of fats, oils, essential oils, and fat-containing foods. Low oxygen- and moisture-permeable foil can also be used as a liner to extend product shelf-life.

. . . **Foil-lined, insulated cases** for shipping frozen meats, bulk ice cream, and other foods greater distances with less refrigeration. Foil-insulated packages are stated to keep about 10 deg. colder than those not insulated with aluminum.

. . . **Soluble film** for food products might be made

CONVENIENCE AND EYE-APPEAL team up in these three advanced packages. At left are bright overwraps for frozen vegetable cartons, made of printed foil-wax-tissue lamination that heat seals. In center is color-printed polyethylene bag for cottage cheese. At right, twin-pack polyethylene bag containing two types of candy.



CONTINENTAL *Landmarks*

Periodic progress reports of interest and value to the food processing field

Improved reclosure feature on shortening cans gives added convenience and product protection

EXTRA LARGE reclosure "lugs" on Continental's new shortening can cover exert more powerful pressure against the inside collar of the can — give positive reclosure each and every time the can is used.

To end the annoying problem of shortening can lids which loosen and pop up after frequent reclosing — and to prolong the shelf life of shortening in the home — Continental has developed a new cover for its 3 lb. key opening hinged can.

Unlike ordinary shortening can lids, Continental's exclusive new cover is made with oversize reclosure "lugs" or "dimples." When the can is reclosed, these longer, deeper "lugs" maintain constant pressure against the can collar . . . keep the cover firmly shut until the housewife is ready to open it again.

Thoroughly tested by our Metal Division research and development center, the new firm reclosure cover is now standard on all Continental shortening cans — another example of Continental's never-ending interest in every detail of modern packaging quality.

Photo closeup shows the difference between the "lugs" on Continental's new shortening can cover and those on conventional covers. This gives an increase of nearly 50% in the gripping action.

TAILOR-MADE PACKAGE SERVICE

CONTINENTAL CAN COMPANY

Eastern Division: 100 E. 42nd St., New York 17
Central Division: 135 So. La Salle St., Chicago 3
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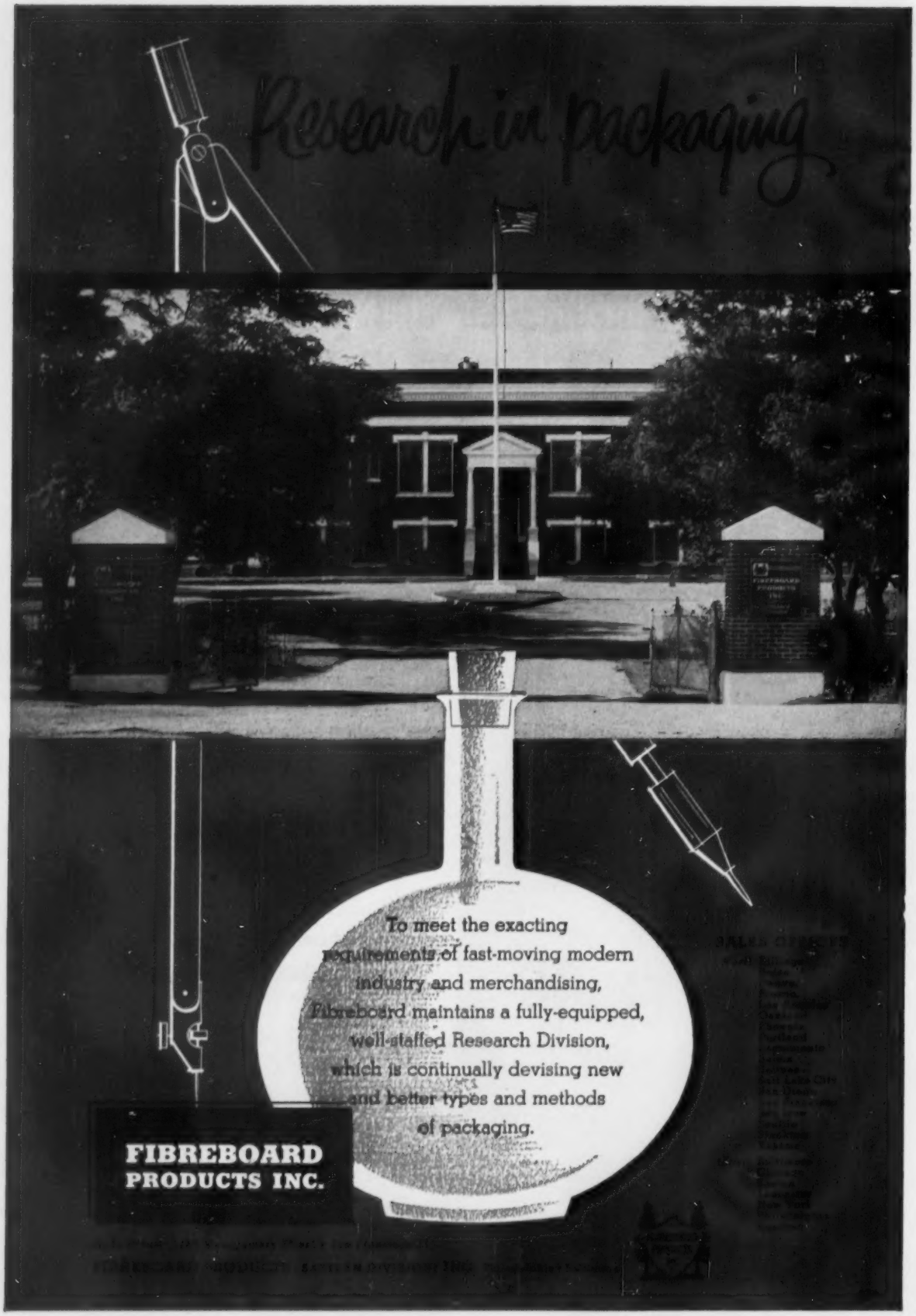

Research in packaging
To meet the exacting requirements of fast-moving modern industry and merchandising, Fibreboard maintains a fully-equipped, well-staffed Research Division, which is continually devising new and better types and methods of packaging.
FIBREBOARD PRODUCTS INC.

out of methyl cellulose containing edible plasticizer, like sorbitol, glycerine, and propylene glycol.

Suppliers of this material are weighing the idea of using it to package dehydrated soups—for convenient reconstituting by dropping package into boiling water.

Leavening agents might be added in same way to dough mixes.

And methylcellulose-coated fish sticks, and similar items, could be deep-fat-fried without picking up too much fat.

. . . **"Package-type fat fryers"** containing frozen shortening and breaded fish, seafoods, shrimp, etc., are likely to appear. Package could be placed in a broiler to fat-fry products without need of deep-fat fryers.

Things You Should CHECK

—When seeking the flexibles most advantageous for your foods and most suitable for your own processing operations and marketing range

Oops! No wet strength.

WHICH MATERIAL? Types are paper, film, foil, coated, or laminated.

In what forms is it available? Rolls, sheets, or converted form are to be considered.

How is it shipped?

What is its range in thickness?

How flexible is it? Some materials are very flexible, others are not. And flexibility at low temperatures is important for packages held in freezer storage. Additives to coatings can keep a package pliable and shatterproof at subzero temperatures.

Is it transparent? Foods are identified at a glance when wrapped with a grainless, crystal-clear material.

Does it protect against light? Light rays can cause foods to stale, discolor, lose flavor and turn rancid.

Will it give the package shimmering gloss? This can add a glamorous appearance to the package. For example, luster can be imparted by an outside protective coating. And coating brilliance can be controlled.

Is it water-resistant? Some materials retain crispness and strength when soaked in water. Others must be treated with urea- or melamine-formaldehyde resins to remain strong when contacting the moist products.

What about grease resistance? This offers protection against penetration of fats and oils.

Is it impermeable to moisture? Does it act as a moisture barrier when subjected to printing, handling, high temperatures and humidity? Material that is a good water-vapor barrier prevents dehydration of moist products and moisture pickup by dry ones. Degree of moisture vapor-proofness can be controlled to suit the product and conditions of packaging and storage.

Moisture-vapor permeability prevents fogging inside the package; also build-up of mold-producing concentrations of moisture.

How about resistance to chemicals? Salt, for example, corrodes aluminum foil.

Is it odorless, does it affect product taste, and is it chemically inert?

What about gases? Some materials "breathe" through their entire surface, without the need of perforations—desirable for certain foods.

Gas impermeability, on the other hand, prevents loss of aroma, therefore protects highly aromatic foods like tea, cheese, and cookies. Pickup of foreign odors and tastes is checked also. And for vacuum- or gas-packed products, impermeability is essential.

Does it convey the impression of cleanliness? This is important for many applications.

What are its aging characteristics? It should not become brittle or dry out.

How about dimensional stability? Look for a smooth-tight wrap without pull lines and resistant to cockling and dimensional change under varying climatic conditions.

Is it self-clinging? If so, it holds well when wrapped around foods. However, sealing techniques are best.

Does it have tear resistance (Elmendorf)? Tear strength is measured in grams per mil.

Is it tough, long-wearing? Make sure it stands up to rough handling and vibrations encountered in rail, truck, or air shipping.

What's its tensile strength? Measurement here is in psi. of material. The strongest Mylar polyester film has one-third the tensile strength of steel.

How about bursting strength (Mullen)? Also measured in psi.

Resistance to failure by flexing? That is, number of flexes without cracking or breaking.

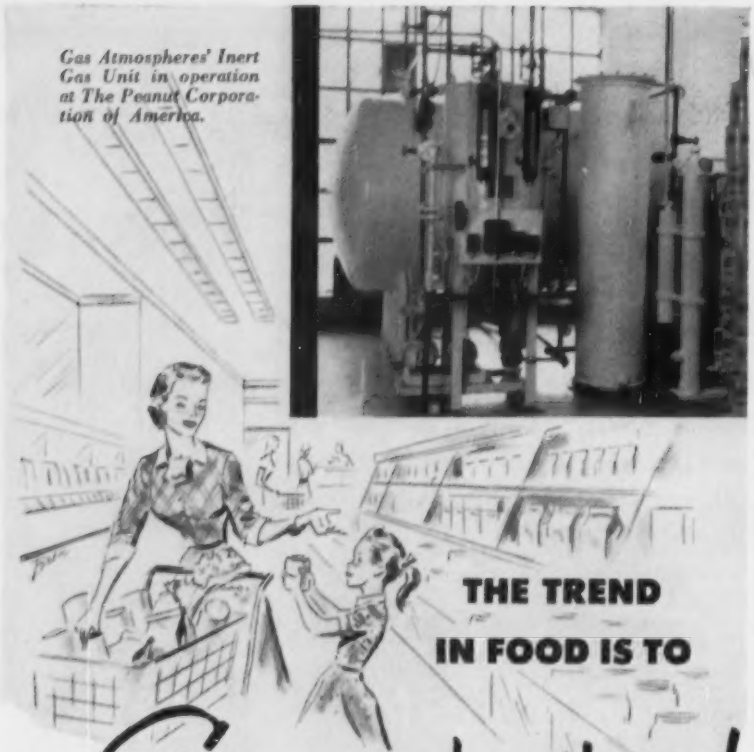
Does it fracture easily?

Do fungi or bacteria act on it? Or does it support growth of other infestation? Is it insect-resistant?

Storage requirements? You should know what conditions are necessary to retain performance characteristics of material.

How do temperatures affect it? Is it flammable? Will it retain a high degree of flexibility over a wide temperature range from its melting point to subzero? What's its tear, tensile, and impact strengths at low tempera-

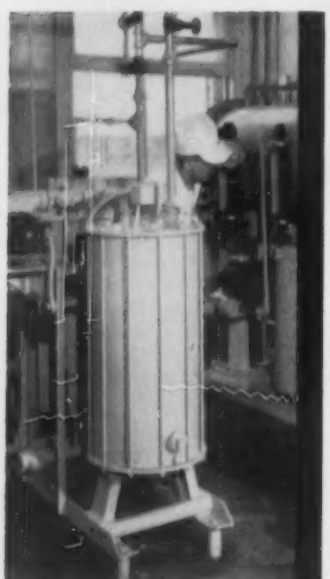
He's looking for luster.



Gas Atmospheres' Inert Gas Unit in operation at The Peanut Corporation of America.

THE TREND IN FOOD IS TO

Gas packaging!



Gas Atmospheres' Inert Gas Unit used in packaging powdered milk at The Nestle Company.

NEVER before have food processors given so much attention to packaging for they have discovered that much of the appearance, nutritive value and taste of their product can be lost through inadequate packaging.

To improve appearance and to keep oxygen away from the product, progressive food concerns are employing tasteless, odorless inert gases. This oxygen substitute protects the product from the point of manufacture right to the table. Food deteriorating oxygen is eliminated. And, Easy-to-use, inexpensive inert gas increases the efficiency of both vacuum and pressure packaging.

Inert gas is especially inexpensive when the food packager manufactures his own gas with a Gas Atmospheres, Inc. high purity nitrogen or inert atmosphere generator that has been specifically designed for the food industry and proven by dozens of users. Why not look into gas packaging and when you do, call upon Gas Atmospheres, Inc., one of the nations foremost designers and producers of gas generating systems.

NO. 46

gas Atmospheres, inc

equipment for producing industrial gases

25011 WEST LAKE ROAD CLEVELAND 16, OHIO

tures? Is it subject to thermal degradation? Oxidation of some films, for instance, stiffen them so that they are difficult to use on machines. What is its resistance to continuous or intermittent heat?

What about humidity? Will the material crack, or not withstand flexing, when humidity is low? Does excessive humidity make it go limp, become "sticky," wrinkle, or refuse to feed properly into machines? What is the humidity range?

Is it heat-sealable? Are heat-sealing temperatures critical? Within a narrow temperature range?

How does it seal? With electrically heated plates? By electrical-resistance, intermittent, jaw-type heaters? Continuous, rotary-type heat-sealers? Band-type continuous sealers? High frequency (electronic) sealers? Impulse sealers?

Melting and softening points?

Does it shrink to conform to shape of product? That is, will machine- or hand-wrapped foods be formed into "skin-tight" packaged items when briefly exposed to steam, hot air or water, or radiant heat?

Can it be used for vacuum or inert-gas packaging? Product shelf-life is notably extended by this rather recent technique.

Can it be laminated? Through lamination, some shortcomings may be offset.

Does it provide a good printing surface? Will you get clear, sharp impressions using single, multi-color, or reverse printing? Can it be printed by flexographic and gravure methods? What of ease and efficiency in the printing job?

What about machinability? Does it handle easily on high-speed machines? On units like wrappers and bag makers? Are static eliminators needed? Does it curl or pucker? Does it print and slide through machines with little friction?

Does it block? That is, do sheets stick together when stacked high?

Can it be used as window material in a carton? Dimensional stability, impact strength, and transparency are important here.

Is it favorable as regards yield and cost? Compare the film's cost/1,000 sq. in. of specific gage with that of other packaging materials.

Will it delaminate?

Has it pinholes? In such material as foil, for example?

Is it compatible with adhesives, lacquers, coatings, plasticizers, etc.?

What is its coefficient of expansion? When laminated to other materials, will it curl, for example?

Will it hold liquids, oils, viscous products, etc.?

Imprint
cartons & labels at lower cost—

Imprints up to 7,500 cartons, etc. per hour!

The "4800" for cartons . . .

can imprint folding cartons, bags, and envelopes with identification data and specifications as needed for current production, inexpensively and quickly . . . permits smaller inventories, saves on storage as well as printing costs. Also imprints dealer advertising literature.

• Speed up to 7,500 items an hour. Printing surface 4 by 18 inches. Uses rubber mats or type from 6 pt. up. Handles material up to 3/16 inches thick, in sizes as large as 18 by 18 inches. Liquid ink dries instantly.

• No tools required for adjustment. Does not need skilled operator. Automatic power stacker optional. Service from 289 points, coast to coast.

Imprints up to 1,000 labels, etc. per minute.

The Tickometer for labels

. . . enables you to dispense with large stocks of preprinted labels; it imprints dates, code or control numbers for immediate requirements . . . saves time, cuts printing costs, and prevents waste.

• Prints up to 1,000 pieces *a minute*, with good register in 2 3/8 by 1/8 inch area, on most paper weights or light card stock, in sizes as small as 1 by 2 inches, as large as 15 by 15 inches, depending on model.

• The Tickometer can be operated by anybody. Feeds, counts and stacks automatically. So accurate banks use it to count currency! Also stamps, marks, cancels tickets, tags, forms, checks, etc., saving clerical time. Rented as well as sold. Nationwide service from 289 offices.

Pitney-Bowes, Inc.

Originators of the postage meter . . . offices in 96 cities in U.S. and Canada

Ask any PB office to show you these money-saving, time-saving machines or send for free illustrated booklets and case studies.

PITNEY BOWES INC.
3848 Walnut St., Stamford, Conn.

Send booklet on: ☐ *Tickometer* ☐ *The "4800" Imprinter*

Name _____

Address _____

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CAMPBELL **VACUUM PACK**
MEAT AND FOOD WRAPPER
PAYS FOR ITSELF IN LESS THAN
SIX MONTHS TIME ON JUST
MATERIAL & LABOR SAVINGS!

Fast, automatic CAMPBELL wrapper saves up to 60% on vacuum drawing packaging films and materials

No question about it — the CAMPBELL Vacuum-Pak's simplified one person operation; its close-fitting vacuum drawn wrap which requires no trays or stiffeners, *unless desired* — ACTUALLY saves enough money on materials and labor alone over competitive methods to *pay for itself in 4 to 6 months time!* In addition, the product's tight wrap minimizes puncture risk and is *vacuum guaranteed.*

Used by America's leading packers, this ingenious automatic vacuum wrapper packages sliced luncheon meats, bacon, chops, patties, wieners, cheese and other food products with equal ease and speed. Simple adjustments require minimum down-time for product change-over. Get complete cost and production facts today.

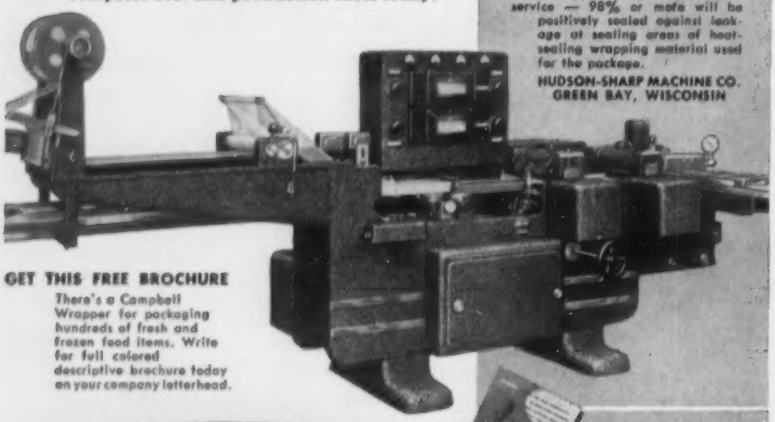
POSITIVE *Guaranteed* SEALING

- 98% of packages positively sealed and guaranteed.
- Vacuum drawn wrap eliminates shrinkage, flavor and color loss.
- Tremendous savings in wrap materials and labor.
- Delivers 40 to 70 Units per minute
- Extends product's shelf life—reduces spoilage and returns.
- Close wrap reduces puncture risk.

Less than 2% package "Leakers"

It is hereby guaranteed that out of every 100 units Vacuum-packed on a CAMPBELL Vacuum Pack Meat and Food Wrapper in regular production service — 98% or more will be positively sealed against leakage at sealing areas of heat-sealing wrapping material used for the package.

HUDSON-SHARP MACHINE CO.
GREEN BAY, WISCONSIN



GET THIS FREE BROCHURE

There's a Campbell Wrapper for packaging hundreds of fresh and frozen food items. Write for full colored descriptive brochure today on your company letterhead.

Campbell
WRAPPER
HUDSON-SHARP MACHINE CO. • GREEN BAY, WIS.

Manufacturers of Aniline and Gravure Presses, Folders, Interfolders, Laminators, Waxers, Embossers, Slitters, Sheeters, Roll Winders, Packaging Machines, Crepers and Tissue Converting Units.

NEW... *Campbell-Pak*

Another first — converts roll stock to low cost filled and heat sealed bags for manual or automatic sequence packaging of liver, brains, kidneys, tongue, kraut, cheese and other products. Write for descriptive literature on this entirely *new method* packaging machine.

Has it scuff- and rub-resistance?

Is it tamperproof and does it resist corner damage? That is, when used as a carton overwrap.

How is it as an insulating agent, heat conductor? Under certain conditions, foil reflects up to 95% of radiant heat. And it works as an insulator.

What of convenience features? For instance, use of tear tapes, heat-in-package or boil-in-bag features, reusability (as with polyethylene bags).

158 SUPPLIERS Of Flexibles

You can contact these makers and suppliers for details on their specific films, foils, papers, laminations, and coated products

A—ACME BACKING CORP., Canal & Ludlow Sts., Stamford, Conn.
Allied Chemical & Dye Corp., Semet-Solvay Div., 40 Rector St., New York City.
Aluminum Co. of America Alcoa Bldg., Mellon Sq. Pittsburgh 19.
Aluminum Foils, Inc., Richmond St. Jackson, Tenn.
Ambler Co., V. C. 1323 N. Main St. Paris, Tex.
American Bag & Paper Corp. Water & South Sts. Philadelphia 47
American Viscose Corp. Film Division 1617 Pennsylvania Blvd., Philadelphia 3.
Ames Bag Co. 1900 Selma Ave. Selma, Ala.
Amos Packaging Div. of Amos-Thompson Corp., Edinburg, Ind.
Arkell & Smiths, 1000 Mill St., Canajoharie, N. Y.
Arvey Corp., 3500 N. Kimball Ave. Chicago 18.
Atlanta Film Converting Co., 1132 Pryor St., S. W. Atlanta, Ga.
Atlas Package & Container Corp. Div. of Protective Coatings Corp., 596 River Rd. Clifton, N. J.

B—BAKELITE CO. Div. of Union Carbide & Carbon Corp. 30 E. 42nd St. New York City 17.
Bemis Bro. Bag Co., 408 Pine St. St. Louis 2.
Bensing Bros. & Deeney Sales Co., 3301 Hunting Park Ave. Philadelphia 29.
Boyertown Packaging Service Corp., 9 Madison St. Boyertown, Pa.
Bracamonte & Co., R. M., 160 Spear St. San Francisco 5.
Braetwor & Assoc., I. N., 2444 Washington Blvd. Los Angeles 18.

Polyethylene-fortified waxed paper packaging supplied by **Central Waxed Paper Company, Inc.**, Chicago, Ill.

greater appeal outside... better protection inside

Polyethylene-fortified wax makes wrappers with greater resistance to scuffing and blocking. Adding BAKELITE Brand Polyethylene resins to wax locks in moisture, keeps crackers crisp with "just made" flavor. They enhance color and printing through greater gloss that catches the busy shopper's eye. There's less rub-off, greater resistance to cracking at low temperatures. And they take a stronger heat seal.

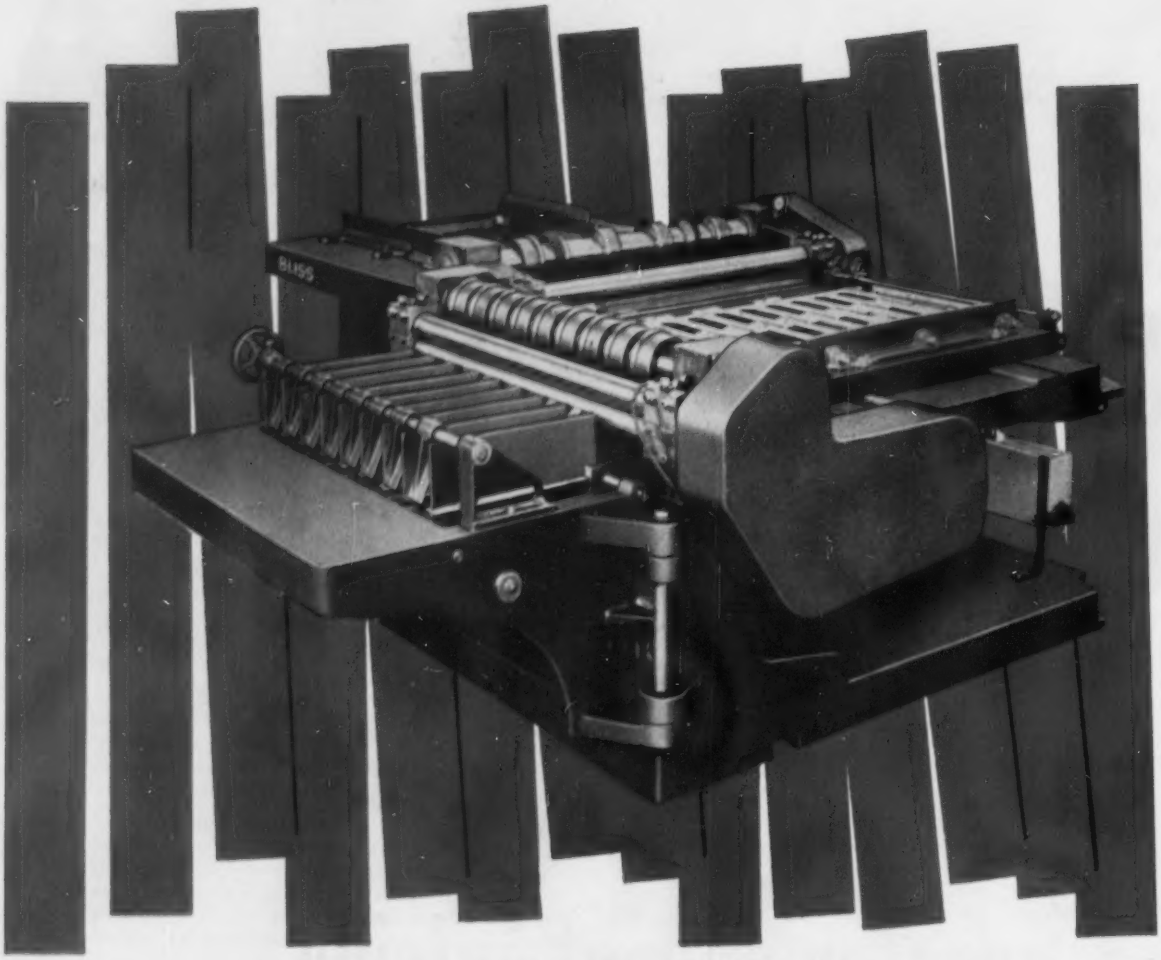
Ask your packaging supplier about...

BAKELITE BRAND PLASTICS

Get the full story on all the ways you can benefit by packaging with materials made with BAKELITE *Brand Polyethylene. For a copy of our 1956 "Packaging Guide," write Department UH-148.*

BAKELITE COMPANY, *A Division of Union Carbide and Carbon Corporation* UCC 30 East 42nd Street, New York 17, N.Y.

The term BAKELITE and the Trefoil Symbol are registered trade-marks of UCC.



Get low cost tinplate slitting with Bliss' fast, new

AUTOMATIC DUPLEX SLITTER

Whether you're slitting body blanks or trimming and squaring tinplate, Bliss' fast, fully automatic duplex pays off in higher speed, greater accuracy and far less downtime. These exclusive design features tell you why—

▶ **1** readily accessible gages and cutters are quickly and easily adjusted, thus it's faster to change over or set up

▶ **2** bearing housings can be removed without dismantling the machine, simplifying cutter changes and saving changeover downtime

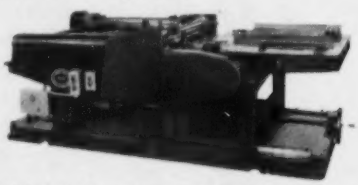
▶ **3** first operation table retracts 20"—the extra room makes it easy to regrind cutters, saves time

▶ **4** cutters can be sharpened in place with motor-driven grinder, a time-saver with every sharpening

▶ **5** heat-treated alloy steel cutter shafts are 3¼" in diameter for greater strength and resistance to deflection

▶ **6** double-row anti-friction bearings provide for radial and thrust loads, assure perfect cutter "settings" and accurate slitting

Why not get the jump on rising material costs now? You can, by finding out how this new 5225 automatic duplex—another in Bliss' rapidly expanding line of high speed can machinery—fits into your set-up. Write today for Section 1, Catalog 36-B.



BLISS 5225 set up as a trimmer and slitter

BLISS SINCE 1857

is more than a name . . . it's a guarantee

E. W. BLISS COMPANY

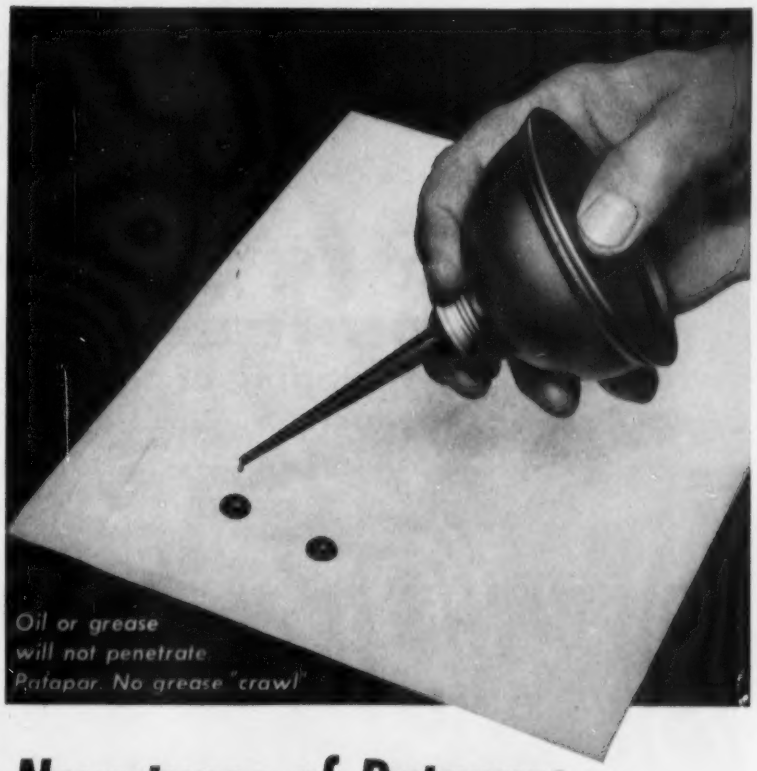
Canton, Ohio

Brooks Paper Co., 400 Security Bldg. St. Louis.

C—CADILLAC PRODUCTS, INC. 2300 Gainsboro Ave. Ferndale 20, Mich.
Canton Containers, Inc., 1101 Ninth St., S. E. Canton 7, Ohio.
Celanese Corp. of America, 180 Madison Ave., New York City.
Cellu-Craft Products Corp., 1401 Fourth Ave. New Hyde Park, N. Y.
Cello-Masters, Inc., 1155 Randall Ave. New York City 59.
Central States Paper & Bag Co., Inc., 5221 Natural Bridge, St. Louis 15.
Central Waxed Paper Co., 5100 W. Roosevelt Rd., Chicago 50.
Champion Bag Co., 160 N. Loomis St. Chicago.
Champion Paper & Fibre Co., Hamilton, Ohio.
Chase Bag Co., 309 W. Jackson Blvd. Chicago 6.
Chester Packaging Products Corp., 684 Nepperhan Ave. Yonkers, N. Y.
Cincinnati Industries, P.O. Box 38, Cincinnati (Lockland), Ohio.
Clear Bag Co., 6812 W. Lake St. St. Louis Park 26, Mo.
Clearprint, Inc., 3639 Dyre Ave. New York City 66.
Cochran Foil Co., 1430 S. 13th St. Louisville, Ky.
Columbia Paper Products Corp., 2335 W. Franklin St. Baltimore 23, Md.
Container Corp. of America Flexible Packaging Div., 358 W. Ontario St. Chicago 10.
Continental Can Co. Shellmar-Betner Flexible Packaging Div. Mt. Vernon, Ohio.
Crawford Co., John W., 160 Varick St. New York City 13.
Cromwell Paper Co., 4801 S. Whipple St. Chicago 32.
Cryovac Co. Div. of W. R. Grace & Co., 62 Whittemore Ave. Cambridge 40, Mass.
Crystal-X Corp., W. Lenni Rd. Lenni Mills, Pa.
Custom-Made Paper Bag Co., Inc. 33-02 Skillman Ave. Long Island City 1, N. Y.

D—DANIELS MFG. CO. 114 W. Kemp St. Rhinelander, Wis.
Denny Paper & Board Co., 2028 Washington Ave. Philadelphia 46.
Diaphane Corp., 1934 Arch St. Philadelphia 3.
Dixie Wax Paper Co., P. O. Box 5116 Dallas 22, Tex.
Dobeckmun Co., 3301 Monroe Ave., P. O. Box 6417 Cleveland.
Dow Chemical Co., Midland, Mich.
Du Pont de Nemours, Inc., E. I., Wilmington 98, Del.
Durapak Mfg. Co., 1003 Madison Ave. Baltimore 1, Md.
Durethene Corp., 7021 W. 60th St., Chicago 38.
Dygert & Stone, Inc., 56 Industrial St. Rochester 14, N. Y.

E—EASTMAN KODAK CO., 343 State St., Rochester 4, N. Y.
Equitable Paper Bag Co., Inc. 45-50



New types of Patapar® break records for GREASE-PROOFNESS

New types of grease-proof Patapar Vegetable Parchment offer a revolutionary way to package products having internal, or surface content of grease, fats, oils. These special lightweight Patapars provide positive resistance to penetration. They completely prevent grease crawl and stop all tendency of wetting by oils.

The effectiveness of the new grease-proof Patapars has been proven in packaging lard, hams, bacon, shortening, margarine, oiled machine parts and many other products. They are recommended as inner liners for multiwall bags, laminated cartons and spiral wound tubes for shipping oily materials.

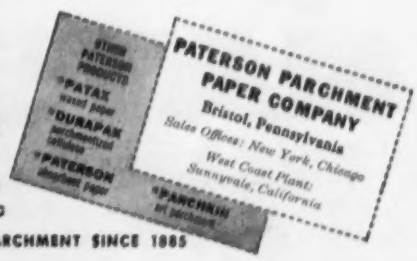
High WET-STRENGTH, Too

Where there is grease, there is usually *moisture*. The special grease-proof Patapars have the answer for that, too. They have the same high wet-strength that is inherent in all the many different types of Patapar Vegetable Parchment. *This wet-strength is sure and permanent.*

LET US SEND YOU SAMPLES. Tell us the application you have in mind and we will send a brochure of testing samples together with technical information.

Write today.

Patapar
Vegetable Parchment
HI-WET-STRENGTH · GREASE-RESISTING



HEADQUARTERS FOR VEGETABLE PARCHMENT SINCE 1885

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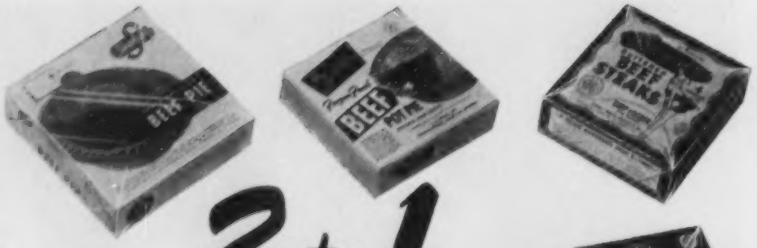


2 to 1
PREFERENCE
for *automatic* wrapping of Frozen Products

praises the adaptability and efficiency of their Hayssen Wrappers.

● A recent survey, made by one of the industry's largest national publications, revealed that Frozen Food Manufacturers use Hayssen Wrapping Machines by a margin of 2 to 1 over the nearest other make, and 4 to 1 over the next two. This overwhelming preference for Hayssen explains why it has become the standard of the industry. The Hayssen is completely automatic from the feed-in of the product to the ejection of the neatly, tightly overwrapped package ready for shipment. The Hayssen will wrap any size package in paper, film or foil, directly from roll stock with heat or glue seal. Let our packaging engineers help you with your packaging problems. WRITE US TODAY for further information.

HAYSSEN
MANUFACTURING COMPANY
Dept. FE-11 • Sheboygan, Wisconsin

First in Automatic Packaging, Since 1910

Albany • Atlanta • Boston • Chicago • Dallas • Denver • Detroit • Los Angeles • Minneapolis
New York • Philadelphia • St. Louis • San Francisco • Seattle • Montreal • Toronto

Van Dam St. Long Island City 1, N. Y.
Extruders, Inc., 3232 W. El Segundo Blvd. Hawthorne, Calif.

F—FORBES LITHOGRAPH MFG. CO. P. O. Box 513, Boston 2.
Fulton Bag & Cotton Mills 170 Blvd., S. E. Atlanta 1, Ga.

G—GENERAL FILMS, INC. Covington, Ohio.
Gering Products, Inc., Kenilworth, N. J.
Goodrich, B. F., Chemical Co., Plastics Div., Marietta, Ohio.
Goodyear Tire & Rubber Co., Inc. Packaging Films Dept. Plant C. Akron
Greenwood Packaging Supply Co., 859-879 Summer Ave. Newark 4, N. J.
Growers Container Corp., P. O. Box 238 Salinas, Calif.

H—H & R INDUSTRIES Nazareth Pa.
Herb-Shelly, Inc., Farmington, Minn.
Highland Supply Co., 717 Main St. Highland, Ill.
Holes Co., Floyd A., 100 Northfield Rd. Bedford, Ohio.

I—IRVINGTON VARNISH & INSULATOR CO., 28 Argyle Terrace Irvington 11, N. J.

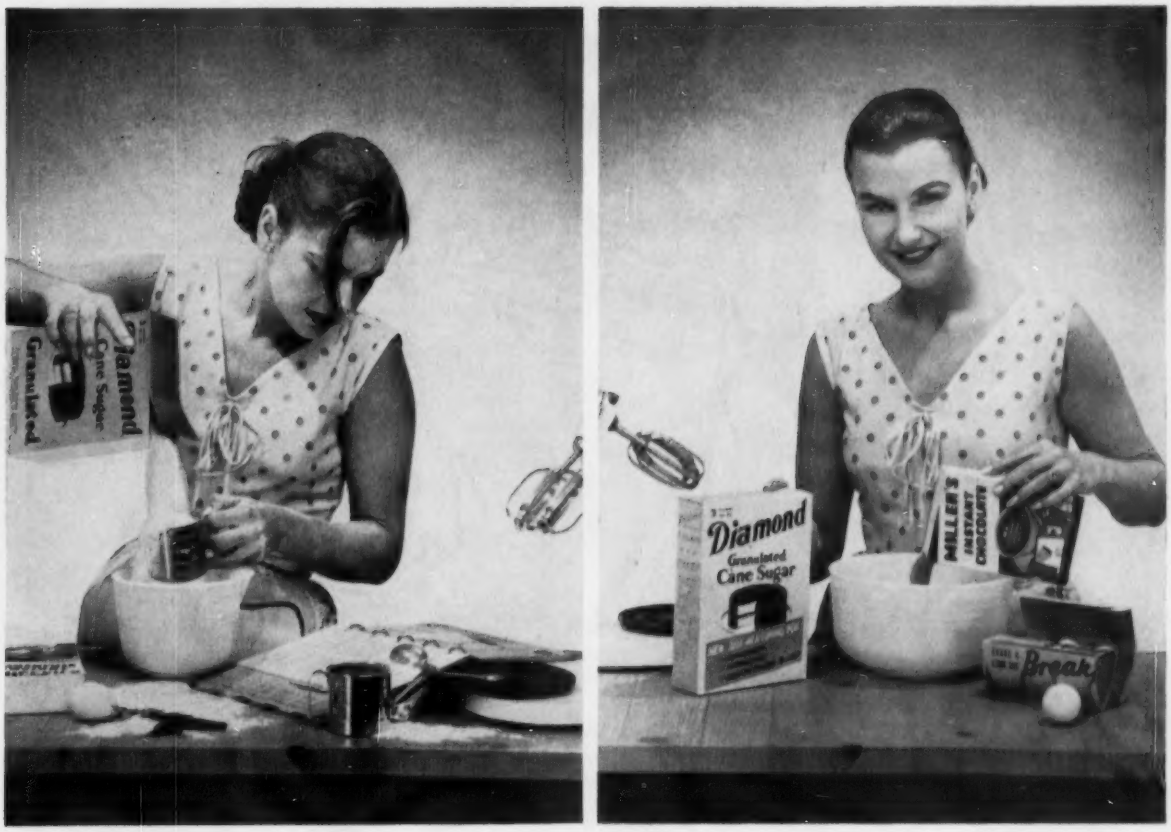
J—JOHNSTON FOIL MFG. CO., 6016 S. Broadway St. Louis 11.

K—KAISER ALUMINUM AND CHEMICAL SALES, INC., 1924 Broadway, Oakland 12, Calif.
Kalamazoo Vegetable Parchment Co., Kalamazoo, Mich.
Kehr Products Co., 401 N. Broad St. Philadelphia 8.
Kendall Mfg. Co., Inc., 520 Erie St. Milwaukee 2, Wis.
Kennedy Car Liner & Bag Co., Inc., Shelbyville, Ind.
Keystone Packaging Service 1012 Washington St. Easton, Pa.

L—LASSITER CORP. 5705 Empire State Bldg. New York City 1.

M—MARATHON CORP., River St. Menasha, Wis.
McLaurin-Angier Co., Needham Heights, Mass.
Mead Corp., 118 W. First St. Dayton 2, Ohio.
Melrose Packaging 814 St. Ann's Ave. Bronx 56, N. Y. C.
Mid-States Gummed Paper Co., 2515 S. Damen Ave. Chicago 8.
Mid-West Wax Paper Co., 1109 Avenue I Ft. Madison, Ia.
Milprint, Inc. 4200 N. Holton St. Milwaukee, Wis.
Minerva Wax Paper Co., 1291 Union Commerce Bldg. Cleveland 14.
Minnesota Mining & Mfg. Co., St. Paul 6, Minn.
Modern Packaging Co., Monroe & White, Mt. Holly, N. J.
Monoca Bag & Mfg. Co. Inc., 2212 Madison Ave., P. O. Box 643 Toledo

NUMBER ONE OF A SERIES



the difference is a METERED container!*

*new folding box measures dry free flowing solids!

Your customers needn't be frustrated any longer by the *mess* of *measuring*. Now *your* product can offer the convenience-plus feature of a self-measuring carton. This remarkable carton actually dispenses pre-determined quantities, insuring an average accuracy of 97% from first pour to last! When opened, drop this carton on the floor, and discover its amazing spill-proof feature.

Unlimited merchandising possibilities, increased brand loyalty, and consumer satisfaction are literally built into this new package. These decisive facts have been confirmed by the nation's foremost packaging experts—learn how *your* product can gain competitive advantage with this new concept.

The U. S. Metered Container Corporation is a designing and licensing firm that is presently developing packages for leading companies in the soap, food, pharmaceutical and chemical industries. The carton can be manufactured by the packer's usual sources. Leading boxmakers have acquired technical know-how on this "miracle package" and the following firms will welcome your inquiries: Alford Carton Co., Ridgefield Park, N. J.; Gardner Board and Carton Co., Middletown, Ohio; New Haven Board and Carton Co., New Haven, Conn.

Send for further details, samples and price quotations.

These exclusive features distinguish the U. S. Metered container over all prior patents:

- Low unit cost . . . fills on all high speed, gravity type equipment
- Your carton size remains unchanged
- Your folding box retains its original capacity
- Flexibility . . . can be designed to deliver almost any measure, small or large

THE UNITED STATES
METERED CONTAINER CORPORATION
527 MADISON AVENUE · NEW YORK 22 · PLAZA 1-0542

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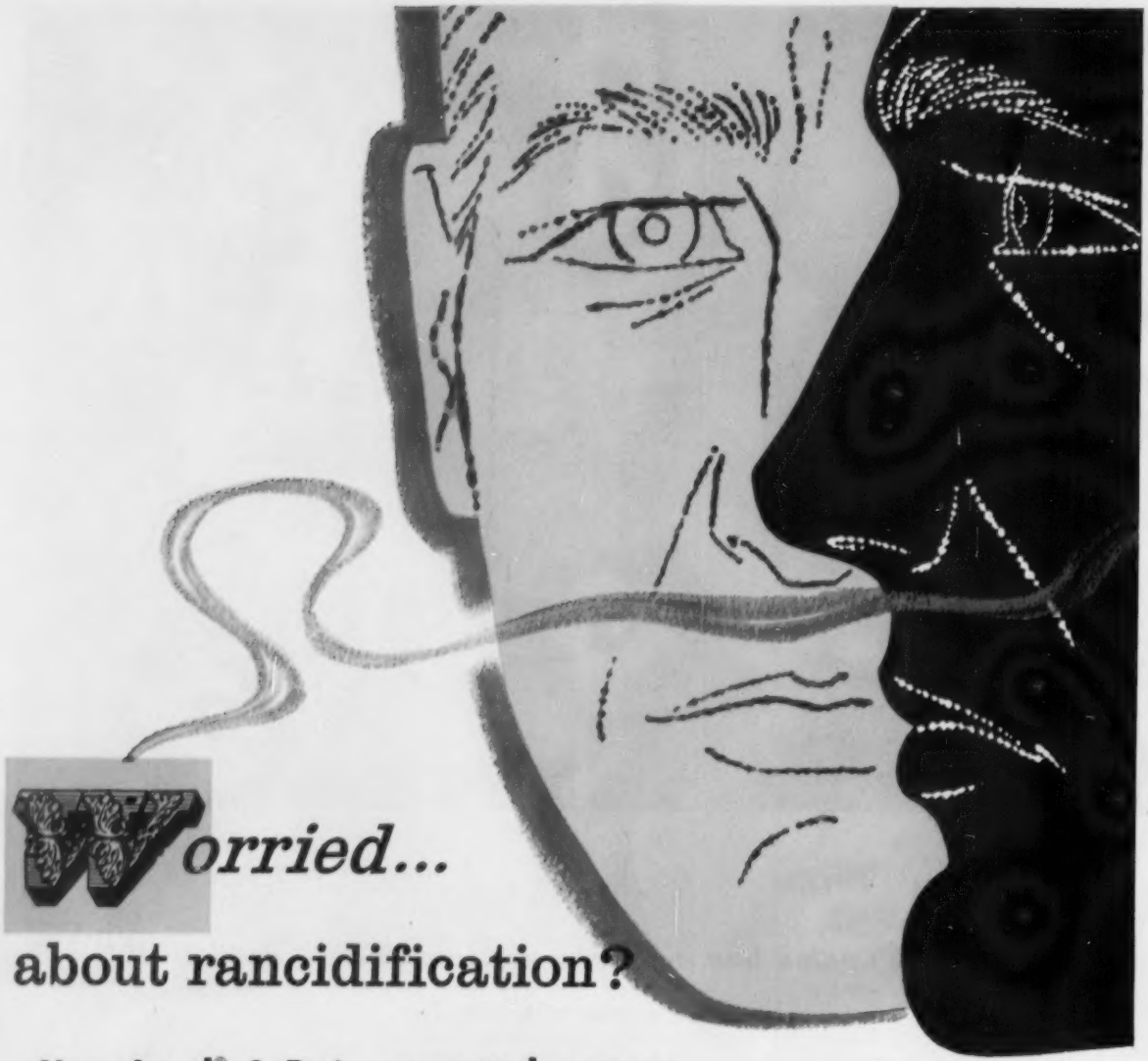


Worried... about rancidification?

New Ionol,® C. P.-impregnated cartons and wrappers protect flavor and aroma . . . *prolong shelf life*

YOU KNOW WHAT a serious, ever-present threat to shelf life rancidification is. Here's a new, simple, yet extremely effective way to combat it—Ionol,C.P. antioxidant.

Rancidity usually begins with fats and oils that have migrated to the surface of packaging materials. But, when boxboard and paper are impregnated with Ionol,C.P. antioxidant, they give dependable protection to aroma and flavor by effectively preventing oxygen attack on fats.

In actual tests, baked goods were stored at 85°F in Ionol,C.P.-impregnated boxboard cartons, which were found to be free of rancidity at the end of ninety days. Without Ionol,C.P. protection, packages of baked goods stored under similar conditions often develop rancidity within a week.

You can insure long shelf life and protection of your brand label's good name by asking for packaging materials containing Ionol,C.P. antioxidant. Write to Shell Chemical for names of suppliers of new Ionol,C.P.-impregnated packaging.

SHELL CHEMICAL CORPORATION

CHEMICAL SALES DIVISION, 380 Madison Avenue, New York 17, New York

Atlanta • Boston • Chicago • Cleveland • Detroit • Houston • Los Angeles • Newark • New York • San Francisco • St. Louis

IN CANADA: Chemical Division, Shell Oil Company of Canada, Limited • Montreal • Toronto • Vancouver

SHELL

Monsanto Chemical Co. Plastics Div., 440 Monsanto Ave., Springfield 2, Mass.
Moser Bag & Paper Co., 3049 E. 55th St. Cleveland 27.
Mosinee Paper Mills Co., Highways 153 & 51 Mosinee, Wis.
Munson Bag Co., 1366 W. 117th St. Cleveland 7.

N—NASHUA CORP., 44 Franklin St. Nashua, N. H.
National Foil Co., 913 Newark Ave. Elizabeth, N. J.

O—OLIN MATHIESON CHEMICAL CORP. Film Div., 655 Madison Ave. New York City 21,
Oneida Paper Products, Inc., 10 Clifton Blvd. Clifton, N. J.

P—PACIFIC COAST FOIL CO. Div. of Jorgenson & Co., 500 Sansome St. San Francisco 11.
Pacific Waxed Paper Co., 220 W. Harrison St. Seattle 99, Wash.
Package-Craft, Inc., 22 Morton St. Paterson 3, N. J.
Package Engineers Co., 609 N. W. 2nd St. Oklahoma City 1, Okla.
Package Products Co., Inc., 1928 Camden Rd., P. O. Box 1888 Charlotte N. C.
Packageneers Box 364, Mason-Montgomery Rd., Foster, Ohio.
Packaging Products, Inc., 111 W. Fifth St. Kansas City 5, Mo.
Packaging Service, Inc., 76 Ely St. Holyoke, Mass.
Paramount Paper Products Co., Inc., Hamilton & 19th St. Philadelphia 30.
Paterson Parchment Paper Co., Bristol, Pa.
Perry Industries Mfg. Div., L. Resnick & Sons 228 S. Front St. Philadelphia 6.
Pexco Bag Mfg. Co. 32 S. Huron St. Toledo 4, Ohio.
Plastic Film Corp., Plainfield, Conn.
Plastics Mfg. Corp., J. E. 555 W. 23rd St. New York City 11.
Plax Corp. Bloomfield, Conn.
Poly Plastic Products, Inc., 2-8 Fourth Ave. Paterson 4, N. J.
Polypane Packaging Co., Inc. 8003 Roosevelt Blvd. Philadelphia 15.
Portco Corp., Vancouver, Wash.
Printon Corp., 304 E. 23rd St. New York City 10.
Protective Coatings Corp. Affiliated with Atlas Package & Container Corp., 596 River Rd. Clifton, N. J
Puritan Packaging Corp., 2319 S. Sixth St. Columbus 7, Ohio.

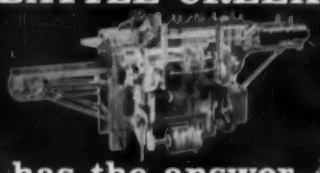
Q—QUATRUM CORP., 437 E. 107th St. Chicago 28.
Queen Transparent Specialties 4637 W. Fullerton Ave. Chicago.

R—R & R PAPER CONVERTING CO., 1412 E. 62nd St. Los Angeles
Rapinwax Paper Co., 150 26th Ave., S. E. Minneapolis 14, Minn.
Republic Foil & Metals Mills, Inc., 55 Triangle St., Danbury, Conn.

If it's a question of

sell

BATTLE CREEK



has the answer

Illustrated is the Battle Creek Model 46, precision engineered to handle delicate packages from 4½" to 10¾" long, 2½" to 6" wide and 1" to 3" high at speeds of 60-100 per minute.

For 44 years, Battle Creek machines have been helping national firms put sales appeal in the merchandising of their packages, while keeping the cost per package at a minimum. You can take advantage of this experience through the selection of one of the *Continuous Flow*® packaging machines built at Battle Creek. *Continuous Flow*® design provides gentle, careful handling of each package to keep the fresh "sell" appeal at the retail level.

LET US WRAP YOUR PRODUCT. Send us samples of your products (or if they are perishable, describe the packages and sizes) and tell us the kind of overwrapping you require. We will either wrap and return them promptly with our recommendations, or give you our best suggestions in answer to your inquiry. If you have specific questions, we would welcome a letter from you.

"*Continuous Flow*" *Packaging*

BATTLE CREEK
packaging machines, inc.
109 TWELFTH STREET, BATTLE CREEK, MICHIGAN

Hoerner Boxes, Inc.

has been keeping company with John Morrell for *17 years . . .*

Morrell porkers first became acquainted with Hoerner boxes 17 years ago. Ever since then, the better parts of these porkers (Morrell Pride E-Z Cut Hams) have gone to market in sturdy Hoerner corrugated containers. And Morrell Pride E-Z Cut Hams arrive at the market plump and juicy with no signs of travel wear to mar their tender looks. Perhaps the products you send to market need an introduction to Hoerner corrugated containers. Just phone or write the office or plant nearest you for the services of an experienced Hoerner packaging engineer.

HOERNER **BOXES, INC.**

GENERAL OFFICES—600 Morgan St., Keokuk, Iowa • PLANTS—Keokuk, Des Moines and Ottumwa, Iowa Sand Springs, Oklahoma • Minneapolis, Minnesota • Fort Worth, Texas • Sioux Falls, South Dakota Fort Smith and Little Rock, Arkansas • Cajas y Empaques Impermeables, S. A., Mexico City D. F., Mexico

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Richmond Paper Co., 27427 Pacific St., Highland, Calif.
Riegel Paper Corp., 260 Madison Ave. New York City 16.
Riley & Geehr, Inc., 2749 N. Lincoln Ave. Chicago 14.
Robert Corp., 240 Canal St., Lawrence, Mass.
Robertson Co., 1145 Glenmore Ave. Brooklyn 8, N. Y. C.

S—ST. REGIS PAPER CO., 230 Park Ave., New York City 17.
Seal Bag Co., Inc., 37 Charlotte St. Rochester 7, N. Y.
Smith Paper Co., H. P. 5001 W. 66th St. Chicago 38.
Spec-Fab Co., Inc. Cherry & Rowland St. Riverton, N. J.
Specialty Papers Co., 802 Miami Chapel Rd. Dayton 1, Ohio.
Standard Bag Corp., 29-10 Hunters Point Ave. Long Island City 1, N. Y.
Standard Packaging Corp., 1 Lisbon St. Clifton, N. J.
Stranahan Foil Co., Inc., S. Hackensack, N. J.
Sutherland Paper Co., 243 E. Paterson St. Kalamazoo, Mich.
Sweetnam, Inc., George H., 282 Portland St. Cambridge, Mass.

T—TECHNICAL PACKAGING PRODUCTS CO., 439 N. 3rd St. Philadelphia 23.
Tee-Pak, Inc., 3520 S. Morgan St. Chicago 9.
Thilmany Pulp & Paper Co., Thilmany Rd., Kaukauna, Wis.
Transpak, Inc., 3745 N. W. 50th St. Miami, Fla.
Transparent Packaging Corp., 1323 Randall Ave. New York City 59.
Twitchell, Inc., E.W., 3rd & Somerset, Philadelphia.

U—UNION PLASTIC FILMS CO. 3518 S. Morgan St., Chicago
United Mineral & Chemical Corp. 16 Hudson St., New York City 13
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Visking Corp. 6733 W. 65th St. Chicago

W—WARREN CO., S. D., 89 Broad St., Boston 1
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West Virginia Pulp & Paper Co. 230 Park Ave. New York City 17
Western Foil Converters 2407 Fourth St., Berkeley 10, Calif.
Western Package Products Co. 510 S. Arroyo Parkway, Pasadena 1, Calif.
Western-Waxide Specialty Package Div., Crown Zellerbach Corp., 2101 William St., San Leandro, Calif.
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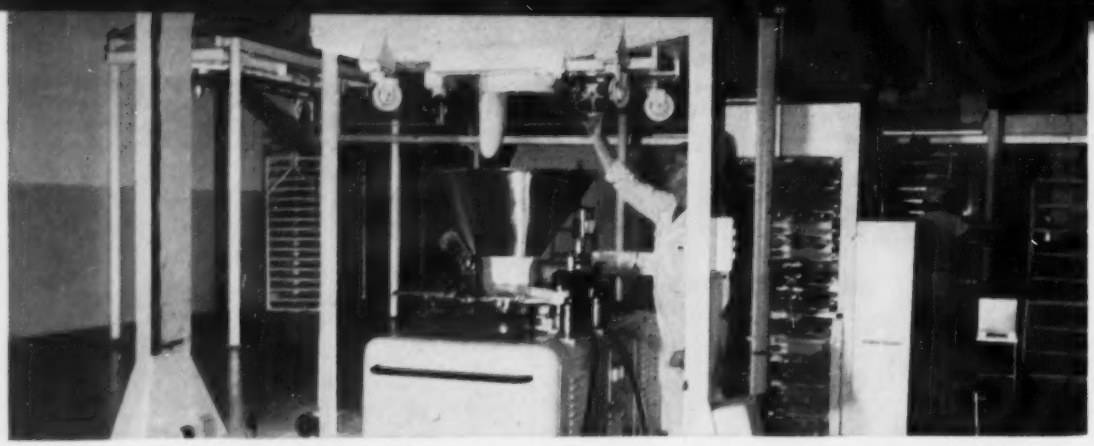
Celite is diatomite . . . works with almost automatic ease with any standard pressure filter. To meet your specific requirements, Celite comes in nine standard grades of microscopically controlled particle size.

Celite is in wide use today filtering sugar, beer, jellies, syrups, cooking fats and oils. If your product is in a liquid state at some stage of processing, perhaps Celite can help you solve the quality versus production problem. A Celite engineer can give you the answer fast.

To get in touch with a Celite engineer or obtain further information on Celite diatomite filtration, write Johns-Manville, Box 60, New York 16, N. Y. In Canada, Port Credit, Ont.

*Celite is Johns-Manville's registered trademark for its diatomaceous silica products.

Johns-Manville CELITE FILTER AIDS



IMPROVED TROUGH eliminates manual transfer of dough to roll panners. It is elevated by pushbutton, then operator opens valve and allows dough to drop gently into hopper of molder panner. See Point (2) in flowsheet.

Pace-Setting Bakery Lines

They feature top engineering, newest processing and materials handling equipment, automatic controls

COMPLETED last January, the new Los Angeles bread and roll bakery of Langendorf United Bakeries, Inc., already has achieved what its designers planned—smooth, continuous, high volume operation with man-hour production rates well above those of conventionally equipped bakeries.

This flowsheet shows process-design highlights.

Liquid ingredients are proportioned to mixers by means of meters at the control panel, located on an elevated platform—Point (1). And dry ingredients are transported pneumatically or by screw conveyors to scales, then to desired mixing unit. All ingredient transfer is done from a check-list formula to avoid error.

Fermentation rooms are semi-automatic, requiring only that troughs be moved into and out of them when cycles are completed.

The automatic rack-type bread dough proofer—Point (3)— is a complete "package" unit. From its central panel, proofing time, temperature, and humidity are pushbutton controlled. The electro-mechanically operated unit has two identical electrical circuits. In event of failure of components of one of these, operation may be continued by switching to the other.

Proofer is powered by five 7½-hp. vari-speed motors. Racks are conveyed on two sets of double-decked rails, by roller chains. At front end of unit is an elevator—Point (4) at the rear a Lowerator. These, too, are comprised of chain and sprocket drives with short lengths of rail upon which trucks of racks are moved.

FOR FULL DETAILS of this bakery's many outstanding advances see "Engineering Reaches New High In This Ultra-Modern Bakery," p. 45.

Elevator mechanism and controls index racks perfectly with the feed and discharge conveyors as they are moved vertically toward the upper set of rails. Automatic loader and unloader operate simultaneously.

From proofer, straps are conveyed to the oven, and hot bread coming from it is automatically depanned and moved by 2-speed belt conveyor to the cooler.

The empty pan conveyor—Point (5)—adds a new automatic, smooth operation to the bread baking line. Pans may move continuously from molder-panner through entire line and return to this unit without any manual attention except when pan sizes are changed.

Pan storage, too, is an innovation. Here, in a separate room from the bakery, pans are stored on sloping, roller conveyors. One operator easily stacks the straps on these, then they roll toward the continuous utensil conveyor, where he may remove them and put them on the conveyor leading to the panner.

New, also, is the automatic roll dough proofer—Point (6). Its ingeniously engineered monorail system integrates operations from panner to slicers.

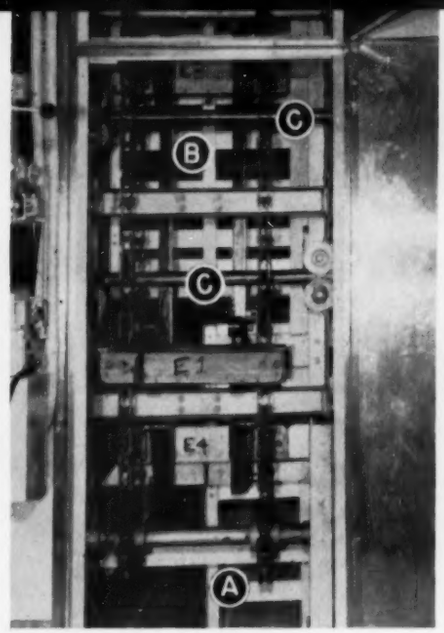
This self-contained unit has its own air conditioning system, and is electro-mechanically operated. Loaded racks are merely moved to rack-stop at entrance to proofer, then by pushing a button on the control panel, operator selects one of three lanes of duo-rails in which he wishes to position this rack. Proofing time is determined by the operating baker.

Racks are just as easily removed from the unit. The operator has only to select the lane from which he wishes to draw one, press the proper button, and the rack is delivered.

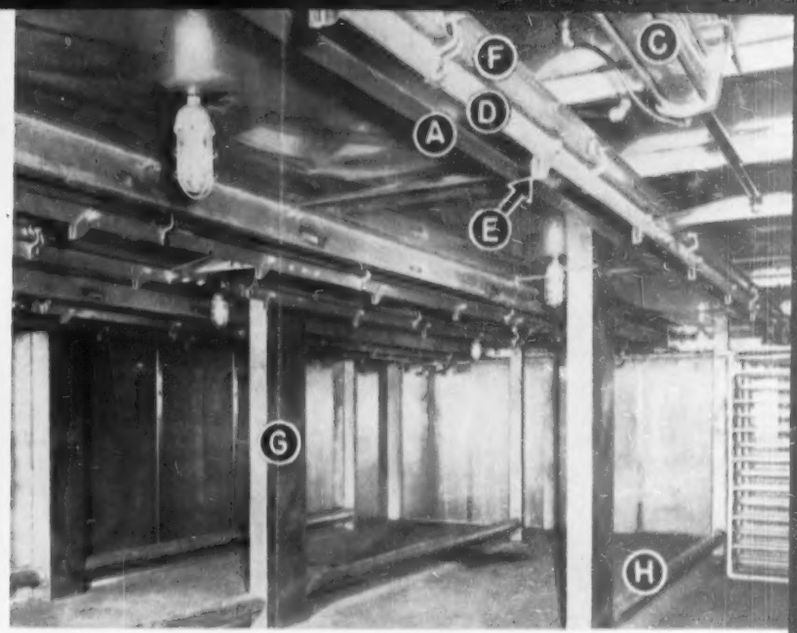
Automatic switches at entrance and exit of roll cooler make it possible to use two lines of monorails—Point (7)—through this unit. And the 118-ft. long stretch of track, which runs along the wall behind operating space and equipment, affords storage space for racks.

Designed specifically for finished baked goods is the 1,100 ft.-long monorail equipped with 325 carriages that accommodate 4 wire nesting-trays. Monorail is powered by a 10-hp. vari-speed motor and has an overall tension shut-off which stops it in case of mechanical failure.

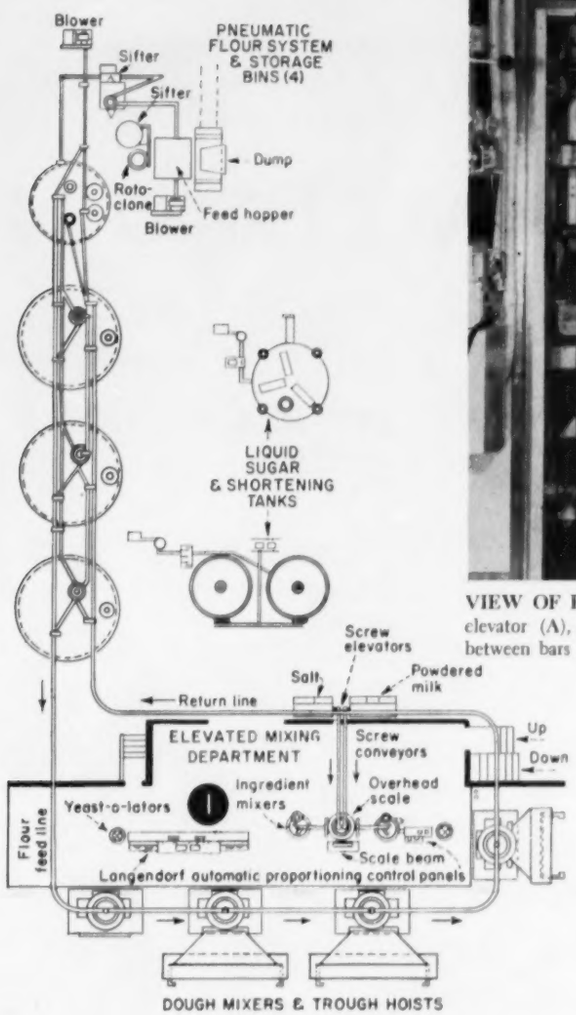
UNFOLD HERE

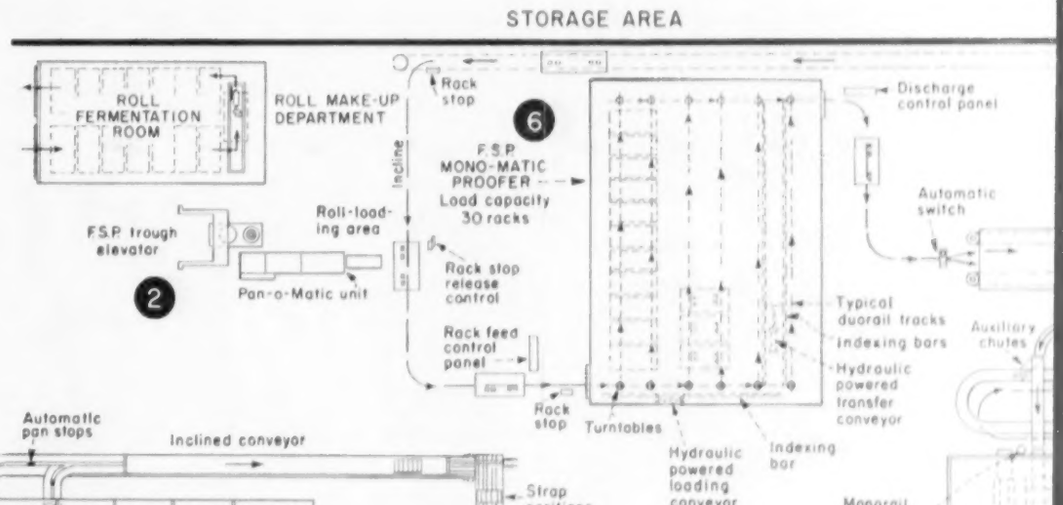


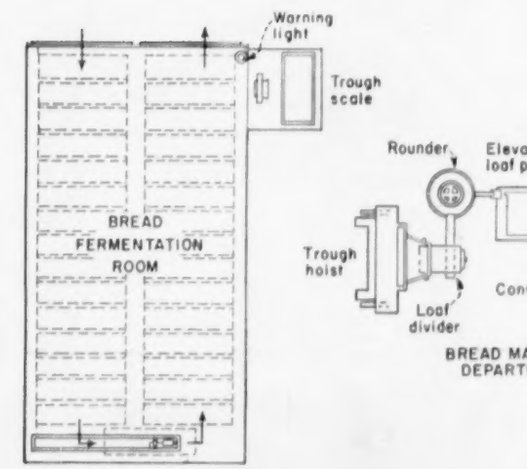
VIEW OF BP PROOFER shows a rack entering elevator (A), another (B) at load-unload position between bars (C). Point (4) in flowsheet.

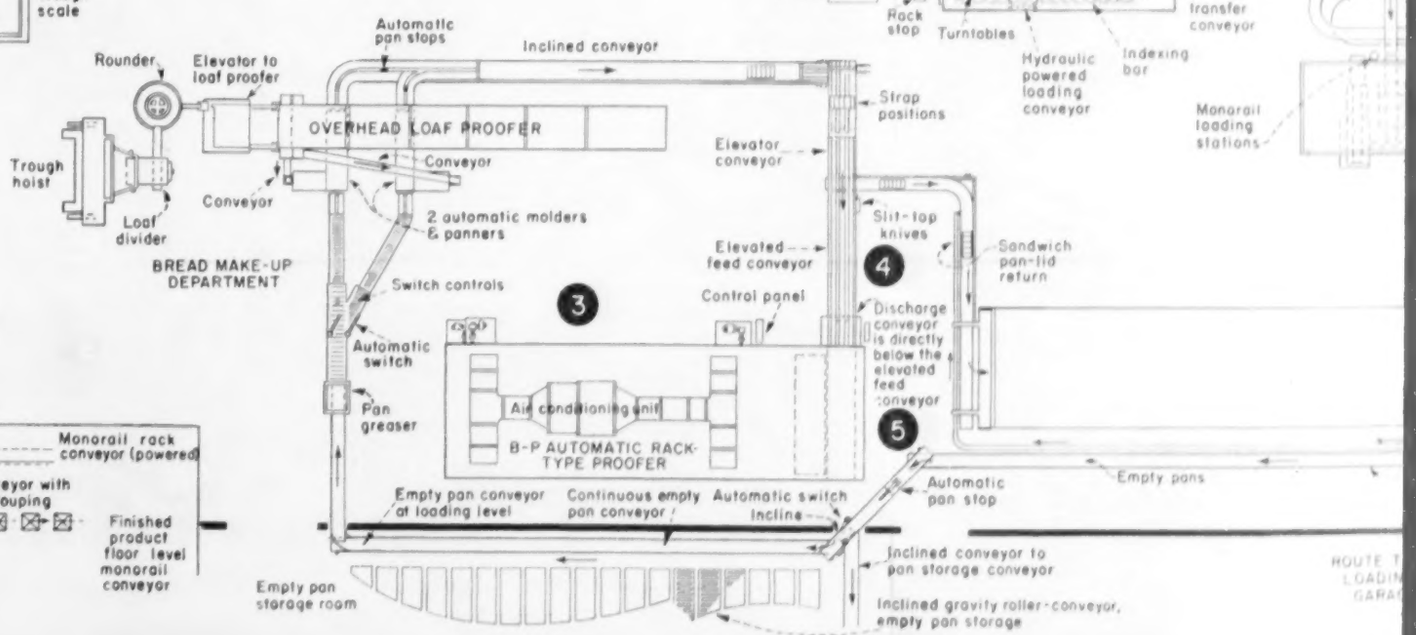


INTERIOR of monorail rack-type roll-dough proofer shows: Duo-rails (A), rack (B), hydraulic transfer conveyor (D) conveyor dogs (E), conveyor tracks (F), vertical air duct (G), and air duct (H). Point (6) in flowsheet.

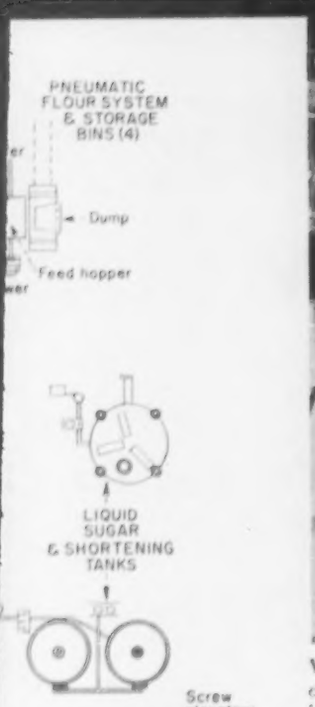


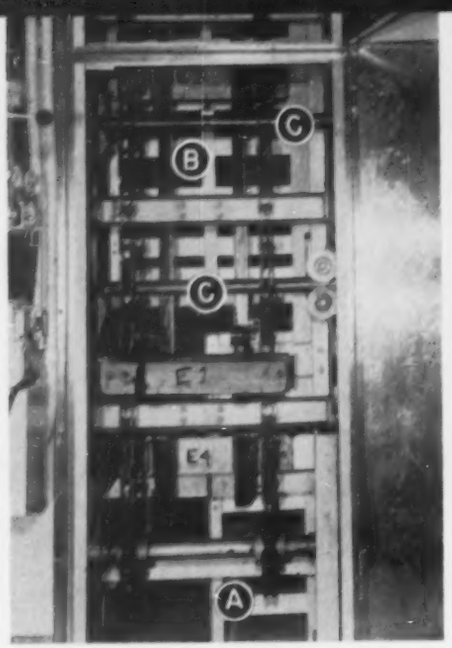




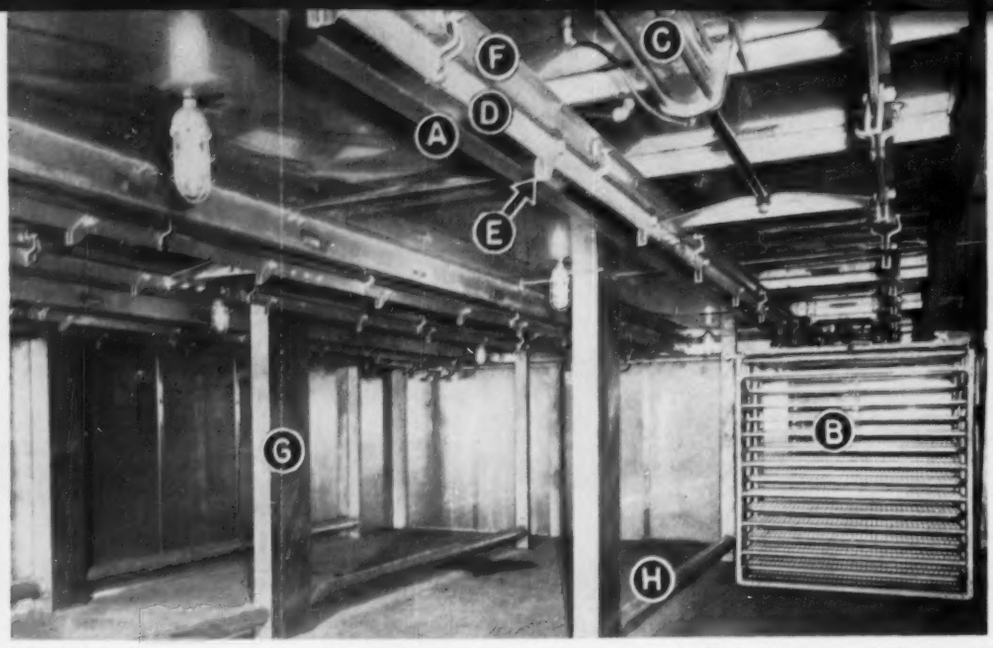


LEGEND
Monorail rack conveyor (gravity)
Monorail rack conveyor (powered)
Flexible chain strap conveyor with speed control for strap grouping
Finished product overhead monorail conveyor
Finished product floor level monorail conveyor

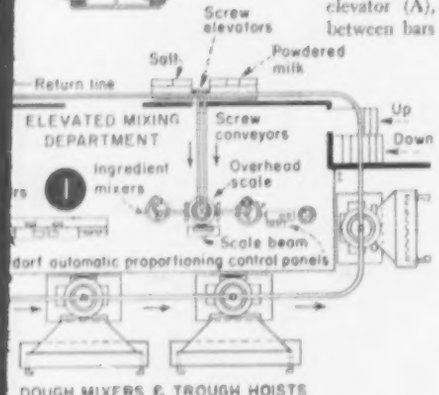


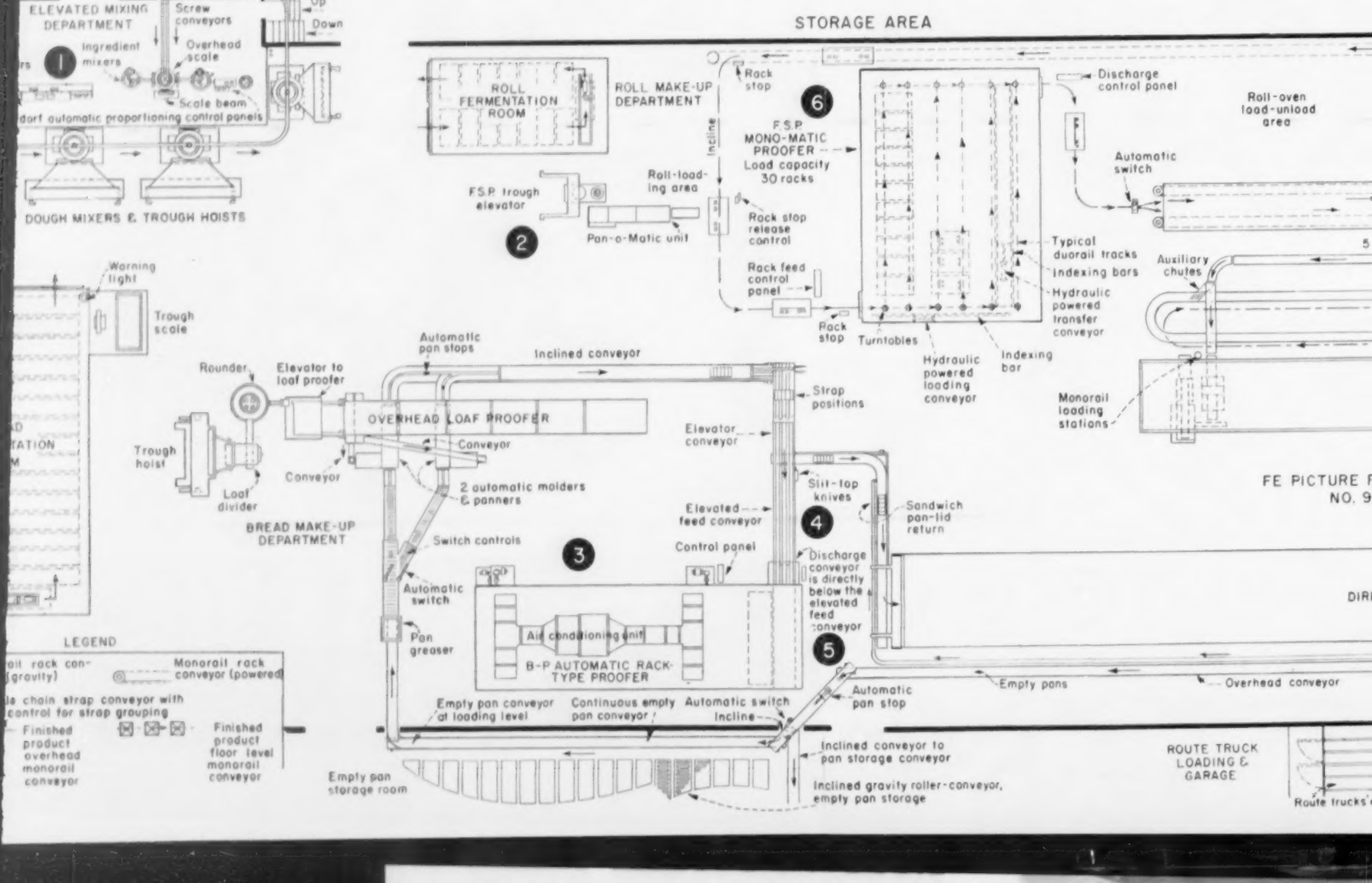


VIEW OF BP PROOFER shows a rack entering elevator (A), another (B) at load-unload position between bars (C). Point (4) in flowsheet.



INTERIOR of monorail rack-type roll-dough proofer shows: Duo-rails (A), rack (B), hydraulic ram (C) that powers transfer conveyor (D) conveyor dogs (E), conveyor tracks (F), vertical air duct (G), and horizontal perforated air duct (H). Point (6) in flowsheet.





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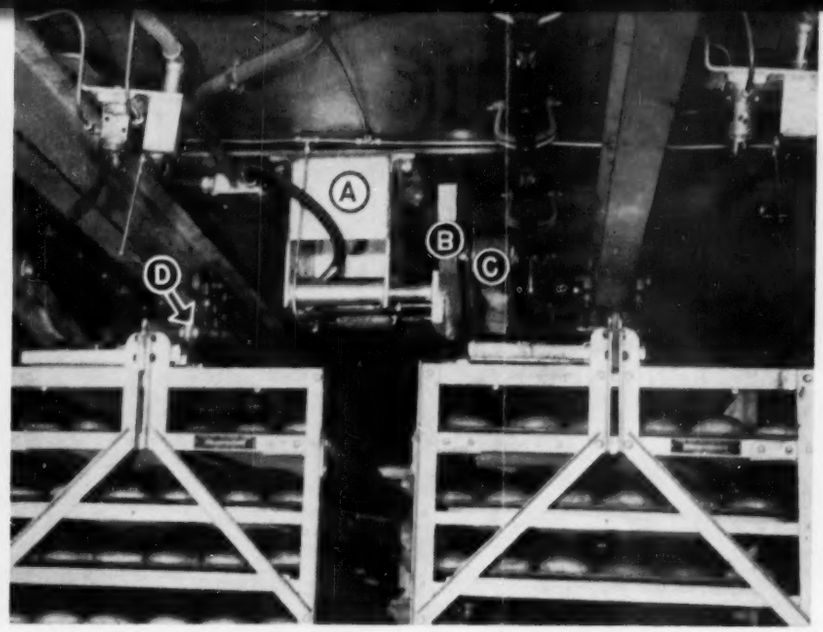


AT EXIT END of roll cooler, pneumatic rack-stop (A) moves inclined plate (B) in front of extended axle of roller (C). As axle moves up plate, it depresses ratchet (D), releasing it from power conveyor and stopping rack. Point (7) in flowsheet.

PROCESS EQUIPMENT LIST

Units and Makers

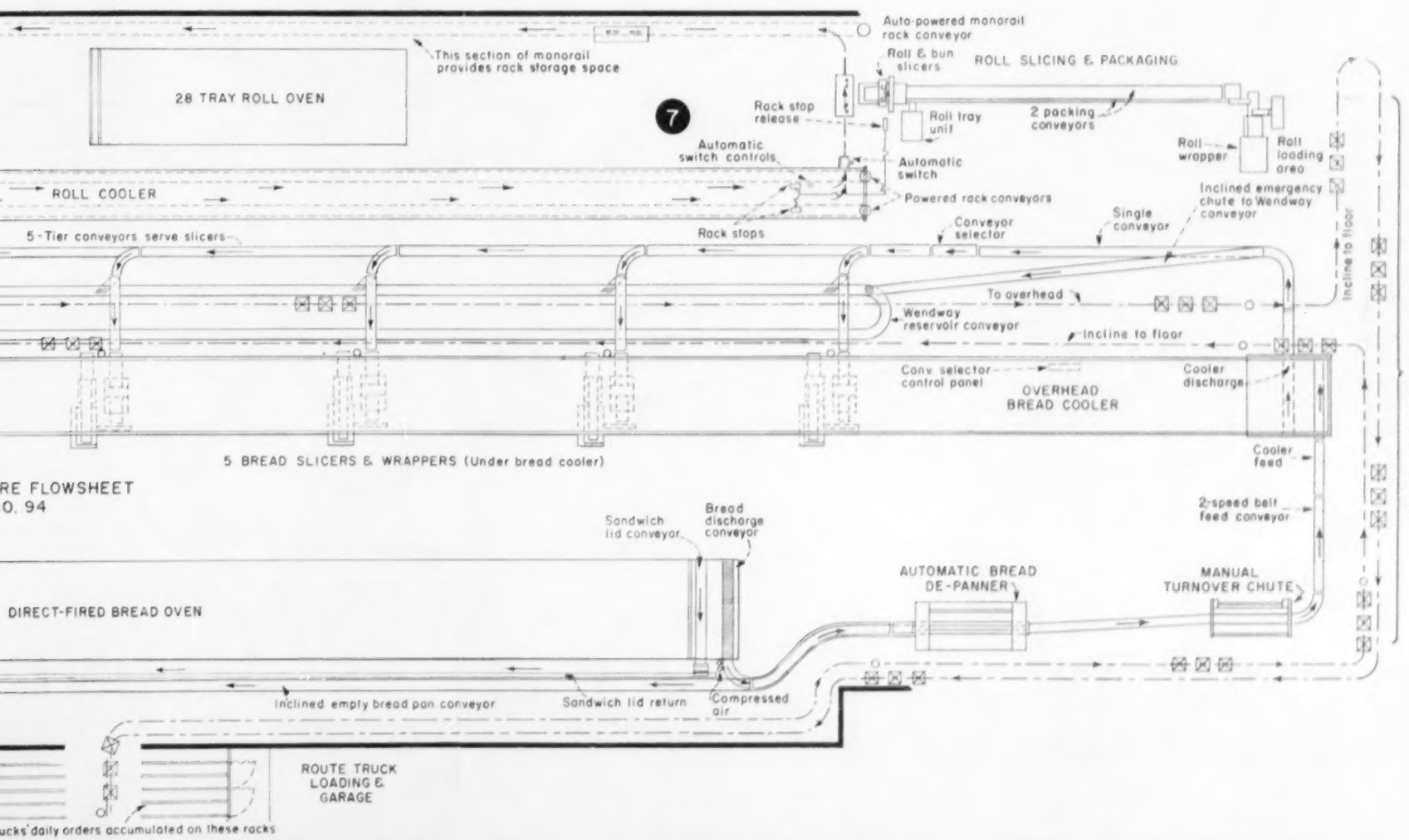
Pneumatic flour system, four dough mixers, four trough hoists, two dividers, proofer elevator, loaf proofer, conveyors (panner to automatic proofer to bread oven to cooler), automatic rack-type proofer, two bread and roll ovens, sandwich pan lid return, automatic depanner, manual turnover chute, bread cooler—*Baker Perkins Co., Saginaw, Mich.*

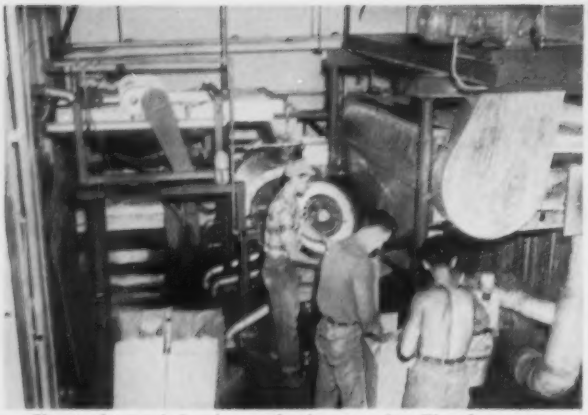
Liquid shortening and sugar systems, two proportioning control panels, salt and powdered milk system, roll trough elevator, roll troughs, empty-pan conveyor and storage system, roll final proofer (MonoMatic), rack monorail system for rolls, roll cooler—*Ferry Steel Products & Equip. Co., San Francisco.*

Two Yeast-O-Lators—*Maine Mach. Works, Los Angeles.* Two ingredient mixers—*Cherry-Burrell Corp., Chicago.* Two bread and roll fermentation rooms, Wendway conveyor, conveyor system to slicers, conveyor selector (Selectier)—*Union Steel Products Co., Albion, Mich.* Trough scale—*Toledo Scale Co., Toledo, Ohio.*

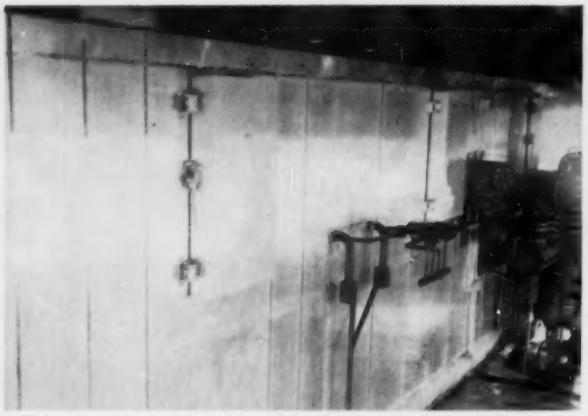
Two automatic molders and two panners, automatic pan greaser—*Read Mach'y Div., Standard Stoker Co., York, Pa.*, Cross graining heads—*Stickelber & Son, Inc., Kansas City, Kan.* Five bread slicers (Slicemaster), five bread wrappers (Super Standard), automatic roll molder and panner (Pan-O-Mat)—*American Mach. & Fdy. Co., New York City.*

Wrapped bread and roll monorail conveyor—*Jervis Webb Co., Los Angeles.* Bun slicer, frankfurter roll slicer—*WayCo Eng. Co., Los Angeles.* Roll tray maker (Tray-Lock)—*Package Mach'y Co., E. Longmeadow, Mass.* Roll conveyor system—*Langendorf, Los Angeles.* Roll wrapper—*National Bread Wrapping Mach. Co., E. Longmeadow, Mass.*





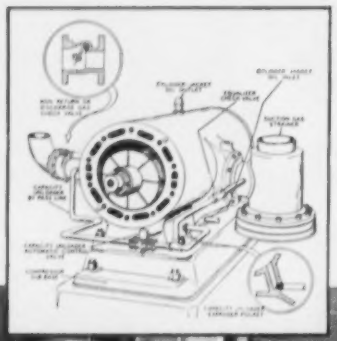
Front of tunnel showing packaging crew handling frozen peas from storage hopper at outlet of second stage freezing belt.



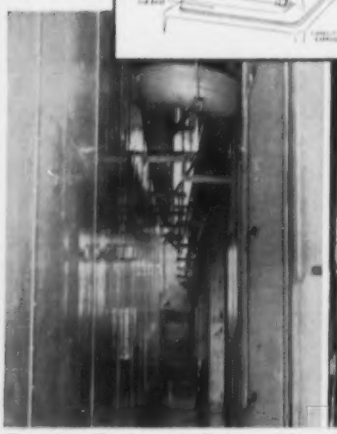
Side view of tunnel enclosure showing access doors to fan and coil compartments. Also shows a part of the refrigerant piping.

how to freeze 100,000 lbs. of peas a day

—AUTOMATION AND THE FES-FULLER ROTARY BOOSTER

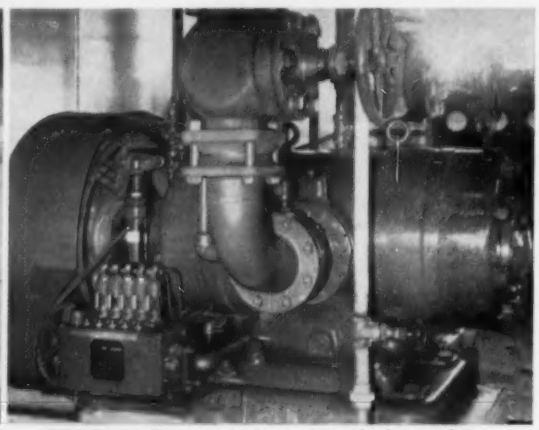


The Nittany Packing Company, Centre Hall, Pennsylvania has, through complete automation, processed more than 100,000 lbs. of peas in a single working day. From the moment the product leaves the picking table, the operation is entirely automatic until deposited in the loading hopper at the end of the freezing cycle. Maintaining the low and constant temperatures required for this belt tunnel is the job of the FES-Fuller Rotary booster.



Freezing Equipment Sales refrigerated flume used to transfer product to first stage. Also precools product to increase tunnel capacity.

Warehouse man stacking 55 pound cartons of frozen product. Product is stacked eighteen feet high. Storage designed to hold one week's production from tunnel.



FES-Fuller Rotary which serves as the heart of the refrigeration system.

Send for complete information.

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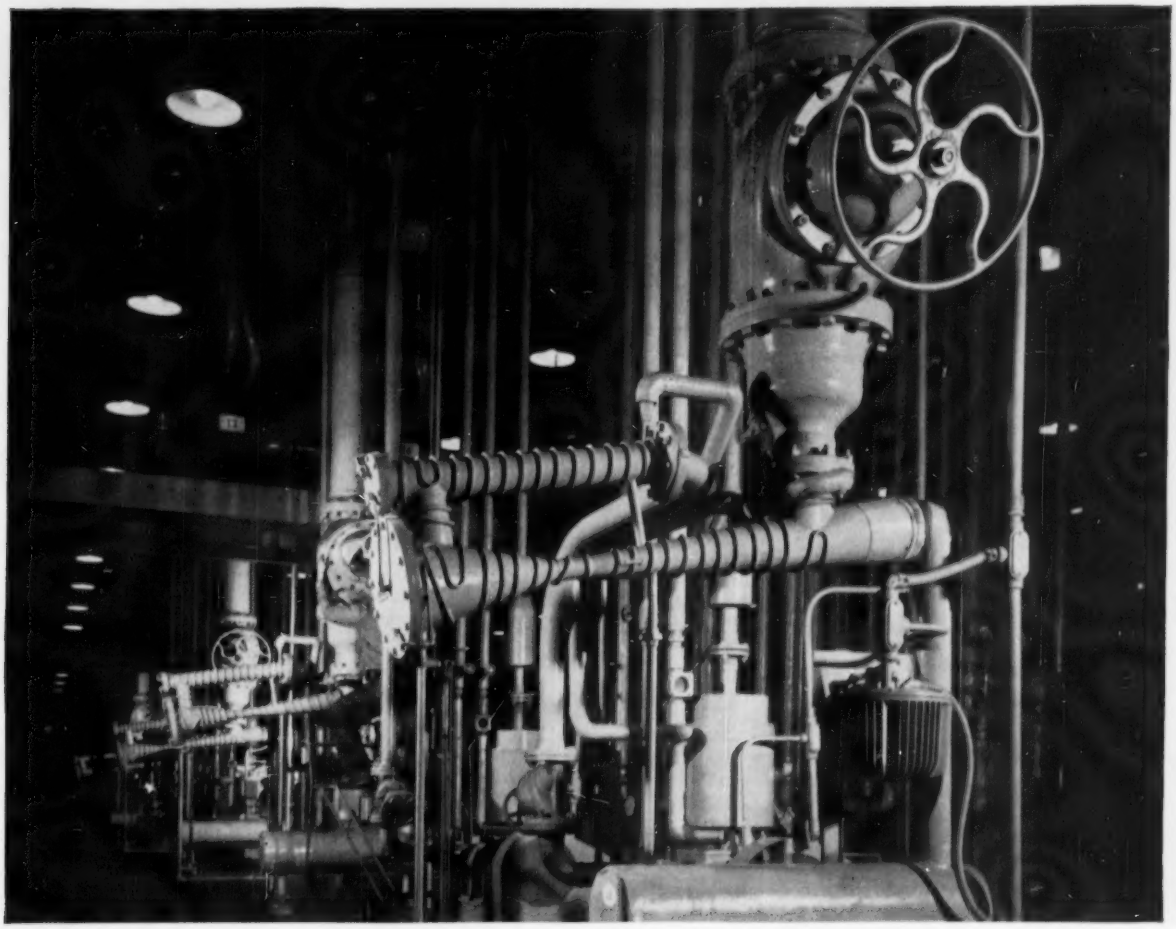


These Crane valves holding 25 microns absolute pressure after 2 years on vacuum service

The Case History—Valves frequently are the most critical points in a vacuum system. But that's not the case with this large Southern light metals refiner.

This plant reports no trouble or expense over a 2-year period in maintaining a vacuum of less than 25 microns absolute for its distillation process.

The tight-holding valves installed about 2 years ago on the lines from vacuum pumps shown above are Crane No. 1611 diaphragm pattern. These 12-in. packless iron body valves are used about once daily.

They've allowed no in-leakage at the seat, bonnet-joint, or through the diaphragm. No maintenance whatever has been given the valves since installed. They operate easily and look good for such service indefinitely.

This high efficiency performance is mainly due to Crane separate disc and diaphragm design. The diaphragm used as a bonnet seal only is not subject to destructive crushing. Conventional type disc and body seat provide a metal-to-Neoprene seating that's ideal for vacuum and hard-to-hold fluids.

Moderately priced, Crane diaphragm valves deserve your consideration for many ordinary services, as well as sludges, slurries and corrosive fluids. They are made in a wide variety of body and trim materials, in ½ to 12 in. sizes.

Ask your local Crane Representative about them, or write to address below for literature.

CRANE VALVES & FITTINGS

PIPE • KITCHENS • PLUMBING • HEATING

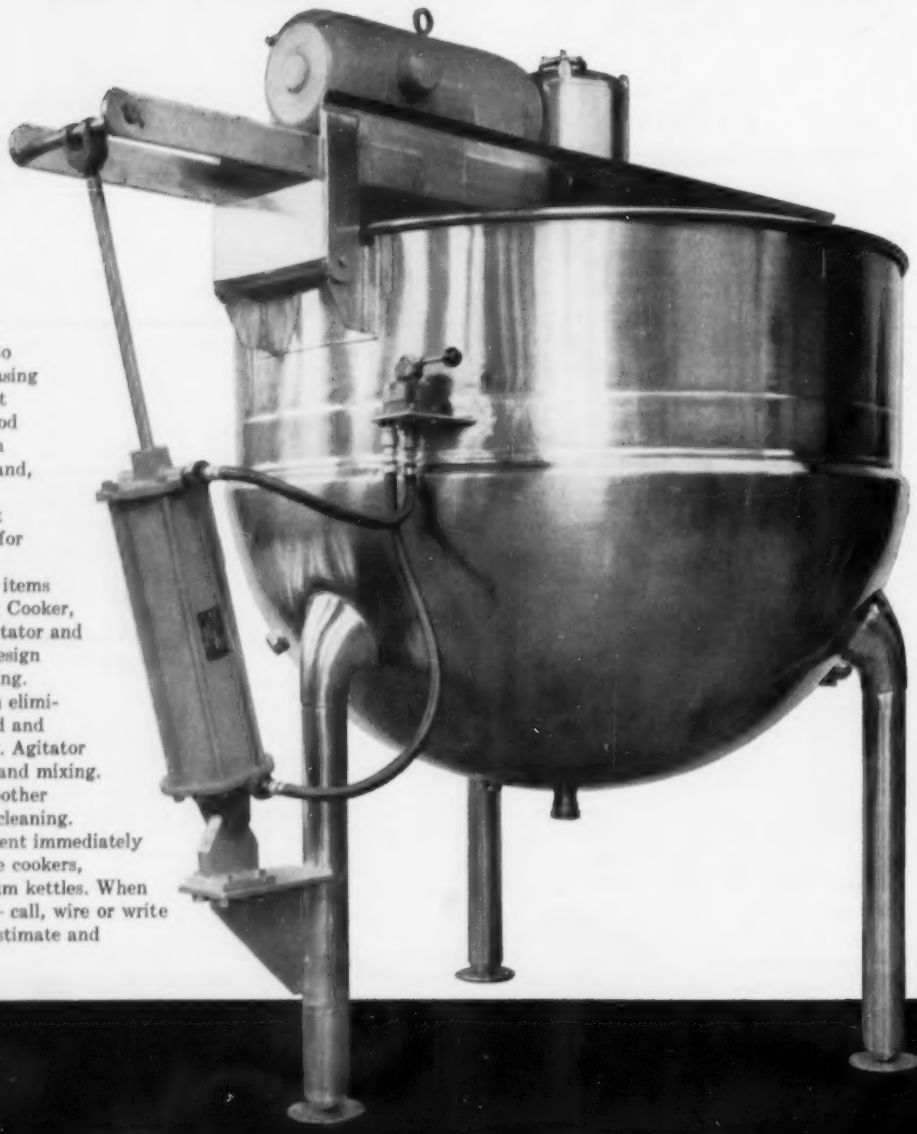
Since 1855—Crane Co., General Offices: Chicago 5—Local Service Everywhere Through Branches & Wholesalers

For more data, circle this page number on card at back →

When You Need a Kettle Quick!

HAMILTON

S.A. mix cooker



Seasonal demands force many of our customers to make last minute purchasing decisions and require fast delivery on orders for food processing equipment. In anticipation of this demand, we carry most of our standard kettles and mix cookers in stock – ready for prompt shipment.

One of these standard items is the Hamilton CG Mix Cooker, with Double Motion Agitator and Hydraulic Lift. Kettle design provides fast, even cooking. Streamlined construction eliminates crevices where food and bacteria normally collect. Agitator insures perfect blending and mixing. Hydraulic Lift gives smoother operation and simplifies cleaning.

Other types of equipment immediately available include pressure cookers, tilting kettles, and vacuum kettles. When you need a kettle quick – call, wire or write Hamilton – for prompt estimate and delivery information.

HAMILTON Copper and Brass Works

Division of Brighton Copper Works, 824 State Avenue, Cincinnati 4, Ohio

THE SHORTAGE OF SCIENTISTS AND ENGINEERS:

What Can Be Done About It?

There is no easy or quick way to overcome the shortage of scientists and engineers that has become a threat to our national security and economic progress. The solution can come only through diligent efforts extending over several years to bring the supply of technically trained people into balance with our needs. Meanwhile, the pressure of the shortage can be relieved if industry, government and education make better use of the limited number of scientists and engineers now available.

Earlier editorials in this series have discussed the dimensions of the shortage of technical manpower, its meaning for our national security and our economic well-being and the causes of the shortage. This final editorial will survey some of the measures that can be taken to overcome the shortage. Most of the proposals presented here have been suggested elsewhere. But in combination they appear to offer the best hope of an answer to this serious national problem.

Soviet Methods Not For U. S.

It is clear that no crash program, inspired by panic and designed indiscriminately to drive hordes of high school students into science and engineering, is suitable for the United States. Even if we adopted Soviet methods of channeling a large portion of our brightest young people into technical fields, it would be at least four years before results appeared in the volume of college graduates. And such an approach would do no credit to the American way of life.

Any crash program, whether it involved totalitarian methods or simply overselling the advantages of technical careers, would be objectionable for other reasons as well. It would jeopardize the quality of scientific and engineering training. It would put many young people in fields where they have little aptitude and deny them to other fields for which they are better equipped. And, if carried too far, it might even result in the overcrowding that was feared prematurely a few years ago.

The most important problems for the long run, as the preceding editorial in this series indicated, are in the area of education. Any real solution must reduce the loss of talented high school graduates who do not continue their education for financial reasons or because of lack of interest. Also, it must improve the quality of high school preparation in science and mathematics and, above all, relieve the critical shortage of teachers.

Basic Needs in Education

Substantial increases in salaries of teachers in most of the nation's school systems are essential if high school students are to receive adequate preparation for courses in science and engineering. Pay scales that have lagged behind rising living costs and salaries available in industry have placed great strain on even the most devoted teachers. There has been a sharp drop in the number of new graduates trained to teach science and mathematics, and of this smaller number many have decided not to follow careers in teaching.

Raising teachers' salaries to more realistic levels must be primarily the job of local school districts, aided by state governments. If, in face of rapid increases in school enrollments, local and state resources prove insufficient, then federal aid will have to be considered. Higher teachers' salaries, however financed, inevitably mean higher taxes. But without appreciable improvement soon, the quality of our entire educational system is in danger.

At the college level also, financial aid is needed to provide scholarships for promising students and to increase faculty salaries. (An earlier series of editorials dealt more fully with these problems, and business aid to higher educational institutions has been mounting at a gratifying rate.)

But not all the educational problems related to the shortage of scientists and engineers can be solved with money. Science and mathematics have steadily been de-emphasized as more youngsters have gone to high school for terminal education rather

How business is helping to relieve the shortage of technical manpower

Summary of a Survey by McGraw-Hill Correspondents

Sponsoring summer study programs for high school teachers

Arranging cooperative work-and-study programs for students

Sponsoring college fellowships and scholarships in science and engineering

Paying tuition of employees taking science and engineering courses

Keeping college faculties abreast of new developments in industry

Hiring high school science teachers for summer and part-time work

Giving old, but usable, laboratory equipment to schools

Cooperating in high school science exhibits

Sponsoring regional science fairs

Sending speakers and training aids to schools

Opening plants for student tours

Analyzing jobs to relieve engineers and scientists of routine work

The McGraw-Hill Department of Economics will be glad to hear of any other ways business is helping relieve the shortage.

than for college preparation. This de-emphasis must be reversed.

Techniques of instruction, furthermore, can stand improvement at all levels of education. Professor E. P. Northrup of the University of Chicago observes: "In the past fifty years . . . there has been a revolutionary change in the character of mathematics, yet not a trace of this change is to be found in the curricula of all but a handful of secondary schools throughout the country." Colleges and universities may have to examine old fetishes about light teaching loads and small classes in order to make more efficient use of their faculties.

What Industry Can Do

Industry has the immediate problem of better utilization of available technical manpower and the long-range responsibility of helping increase our resources of trained people. Frantic recruiting practices and reckless bidding up of starting salaries—financed largely by government money for defense orders — are not the answer. There is need for earnest consideration of incentives for experienced scientists and engineers, who too often must look to sales or executive positions for adequate financial recognition.

Industry in many instances could make more efficient use of engineers and scientists by shifting work to technicians, clerical personnel and even machines. One company found that 15% of the time of an engineering design group was spent on routine jobs and that this valuable time could be saved by adding a technician and a clerical worker to the group.

Other potential sources of technical manpower could be tapped more extensively to relieve the shortage. Very few women have entered what has been traditionally a man's world. Negroes are only slowly gaining educational and employment opportunities in technical fields. And many experienced older men can still give useful service.

A Good Beginning

Much is being accomplished already in efforts to attract more young people into scientific and engineering careers. A summary of some of the things business is doing is presented above. Other notable contributions are being made by such organizations as the professional engineering and scientific societies (especially through their manpower commissions), the National Science Foundation, the National Research Council, the National Education Association, the National Merit Scholarship Foundation and the Thomas Alva Edison Foundation.

Results are beginning to appear in rising enrollments in engineering schools and technical institutes. Between 1951 and last year, according to McGraw-Hill's annual survey of technical institutes, enrollments in these schools rose from 46,000 to a record 67,000. Engineering enrollments rose in the same period from 166,000 to 243,000. A rising tide of graduates is already being made available to American industry.

This is a good beginning. But only with wider appreciation of the serious implications of the shortage of scientists and engineers and intensified efforts on the part of business, government and education to relieve the shortage can we hope to overcome this threat to our national security and economic well-being.

This is one of a series of editorials prepared by the McGraw-Hill Department of Economics to help increase public knowledge and understanding of important nationwide developments of particular concern to the business and professional community served by our industrial and technical publications.

Permission is freely extended to newspapers, groups or individuals to quote or reprint all or parts of the text.

Donald C. McGraw

PRESIDENT

McGRAW-HILL PUBLISHING COMPANY, INC.

This ad will have America talking turkey—ACRONIZED* turkey!

You've seen it happen before—when the housewives of America get hold of an improvement in food for their families, nothing can stop their march toward the new and better product.

Acronized poultry is that kind of product . . . and women are hearing and reading about it month after month in the greatest consumer advertising campaign the industry has ever had. The full-page ad you see here, for example, runs *in full color* in November 19th "Life" and in December "Good Housekeeping."

This ad is a house-to-house salesman for every processor who holds an Acronized franchise . . . creating immediate consumer demand and retail sales for Acronized turkey, *under his own brand name.*

If you are not yet franchised to process Acronized turkeys, our technical field men are ready to help you qualify. A letter or phone call will start you on the way to using this revolutionary new process that maintains the freshness of fresh-killed poultry and adds protection to frozen birds when thawed.

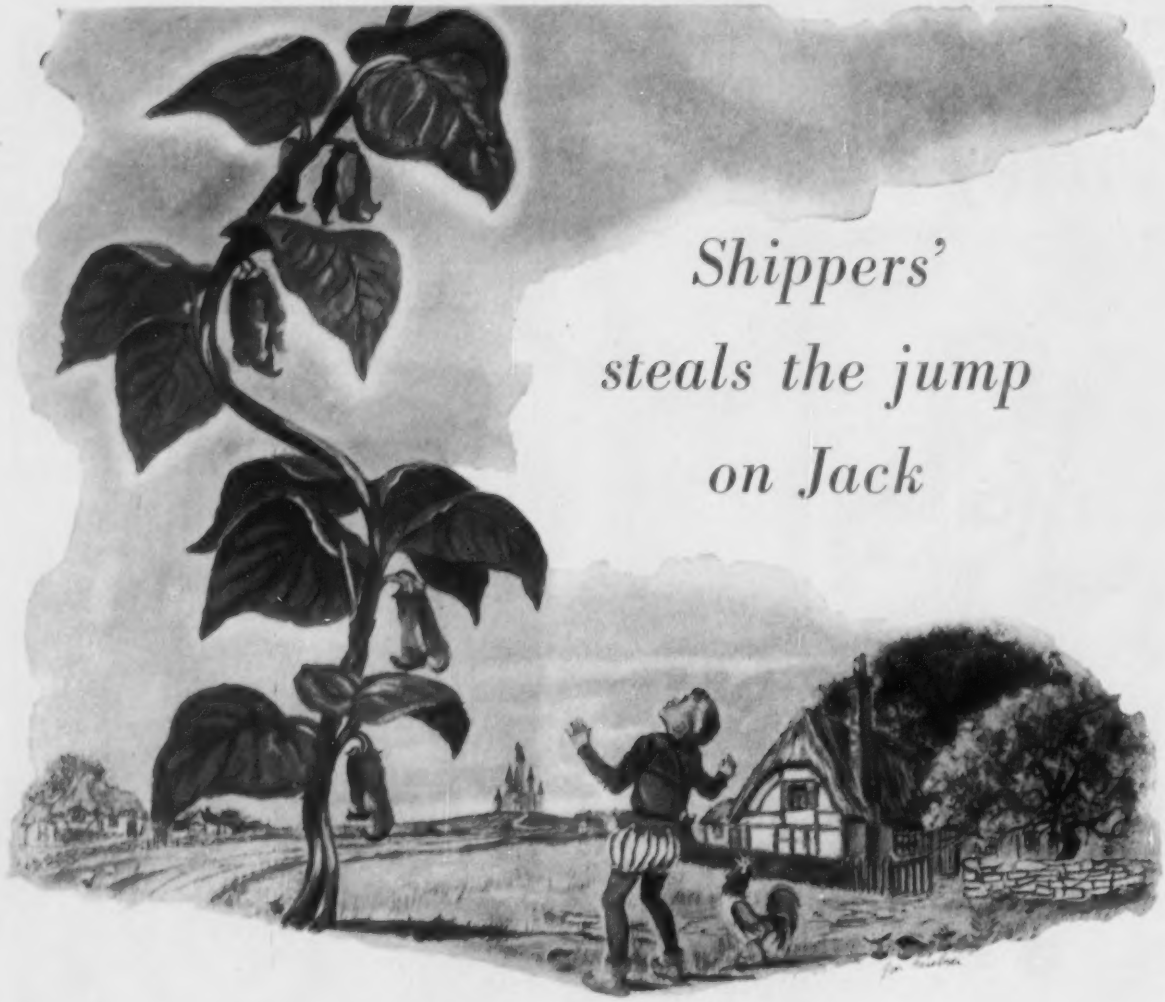
For information on how your plant may qualify, write American Cyanamid Company, Food Industry Department, 30 Rockefeller Plaza, New York 20, N. Y.

CYANAMID

RIDE THE TREND TO ACRONIZED* POULTRY!

*ACRONIZED is a trademark of American Cyanamid Company

For more data, circle this page number on card at back →



Shippers' steals the jump on Jack

Typical DURADOME . . . designed for vinyl acetate service.

Story-book magic may be all right for growing beanstalks, but it takes a lot more than "abracadabra" to make a tank car fleet grow.

Among other things, it takes planning, organization and not a little vision. But above all, it calls for the kind of *dependable* service which we have been delivering for 35 years. That's why so many leaders in American industry rely on Shippers' for modern tank car service.

For instance, since 1952, the number of Shippers' tank cars has increased more than 20%. That's a growth unparalleled in the industry, and makes Shippers' the fastest growing fleet on the rails!

As exclusive sales agent and lessor for acf built DURADOMES, we'll be glad to help you determine the comparative advantages of rental or outright purchase. There's no obligation.

SHIPPERS CAR LINE SHPX

SHIPPERS' CAR LINE

Division of acf INDUSTRIES, Incorporated

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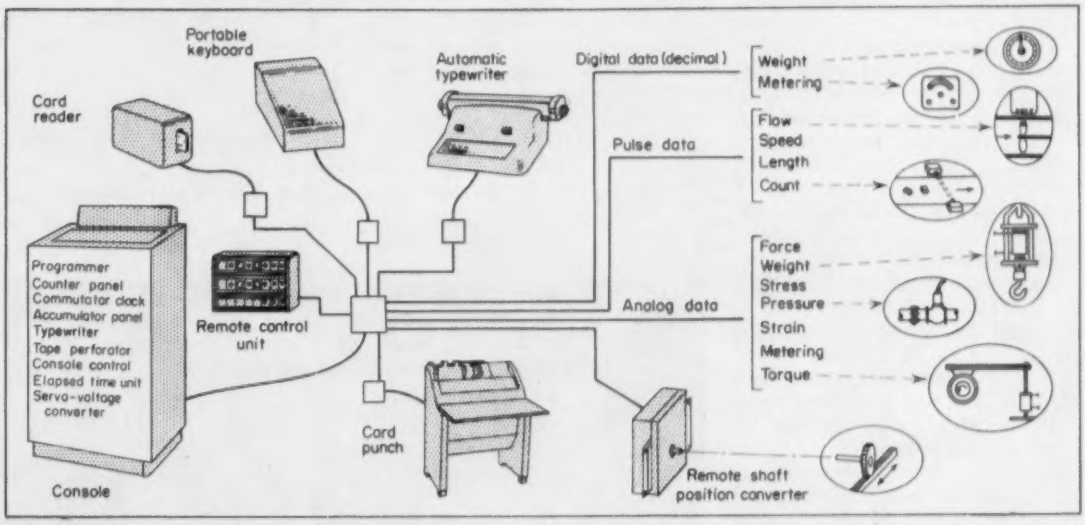
CUT OUT AND FILE

NEW EQUIPMENT & SUPPLIES



SCHEMATIC for fully integrated industrial data processing: System employs automatic and manual input devices (card readers, card punches, remote typewriters) to collect, store, correlate, and record production information from various instruments. Console control unit permits manual introduction of data.

Electronic Units Automate Plant, Office Data Processing

Seen speeding the trend toward plant and office automation are two new systems employing electronic data-processing equipment.

- First is an automatic unit which extracts vital information from production lines and assembles it in a form suitable for quick action.
- The second is a compact assembly for processing business transactions as they occur. It stores millions of facts and figures in a disk-memory unit and adjusts all affected records to account for a transaction.

Both systems are available on a monthly rental basis.

Automatic Production Recording

Illustrated above is the industrial data-handling system (APR), which correlates and stores up-to-the-minute information on punched cards and tapes. Simultaneously, it prints out reports on automatic typewriters along the production line. Card and tape media, containing variables such as weight, count, and temperature, plus data identifying the product and process, serve as input to accounting machines.

Key unit is the programmer which coordinates flow of data from input and storage elements to output devices. Flexibility of the system is attributed to use of 16 "building blocks," which may be combined to meet widely varying applications.

Measurements made by mechanical or electronic sensing devices are converted, if necessary, to digital forms suitable for storage or output. An on-demand or time-programmed readout can be initiated at any stage, and all data are stored and processed by accumulator and counter panels.

Output by typewriter is primarily for use in the production area, while perforated tapes can be converted to cards when processed by automatic tape-to-card punches. An 8-ft.-dia. reel, with about 300 ft. of paper tape, holds punched information equivalent to about 350, 80-column punched cards.

Reels are easily stored or mailed to data-processing facilities. Tape-recorded information may also be transmitted over regular telegraphic systems, particularly useful when a company with central data processing has a number of widely separated plants. (115A)

Continuous Accounting

In addition to automatic production control, electronic machines can minimize the time lag between of-

ELECTRONIC LEDGER: Compact data-processing machine records business transactions as they occur. Equipment consists of disk-memory unit (right background), punched-card input device, output units offering both printed and punch-card records, and operator's control center (right).

fice transaction and report, by eliminating sorting and batch processing in many cases.

Thus, operations such as billing, inventory control, and payroll distribution may be automated by a space-saving system known as 305 RAMAC (Random Access Memory Accounting Machine). Its memory unit stores 5,000,000 digits, any of which can be reached in milliseconds without scanning intervening data. Another system (650 RAMAC) has a storage capacity of 24,000,000 digits, equivalent to a file of records requiring 300,000 punched cards for storage.

In effect, data flows to an "electronic ledger" which is always up to date and immediately available for electronic interrogation.

The 305's memory unit consists of 50 magnetic metal disks arranged in a vertical stack. Since both sides of a disk are used for recording, there are 100 disk faces available for data storage. Each of 100 recording tracks on a face holds five 100-character records.

As disks rotate at 1,200 rpm., information flows to and from the memory unit on an access arm that moves vertically and horizontally under electronic control. Besides the memory unit, these are the principal components of the system:

Console—Feeds data to the system through a punched-card reader, interrogates the memory unit, and supplies answers by automatic typewriter.

Processing Unit—Contains magnetic drum for storing program instructions and control circuits for data handling.

Card Punch—Used as an output device only, it takes information directly from processing unit's drum memory and punches up to 100 cards per min.

Printer—Prepares printed reports automatically. (115B) — *International Business Machines Corp., 590 Madison Ave., New York City 22.*

Circle Key Numbers on Reader Service Card

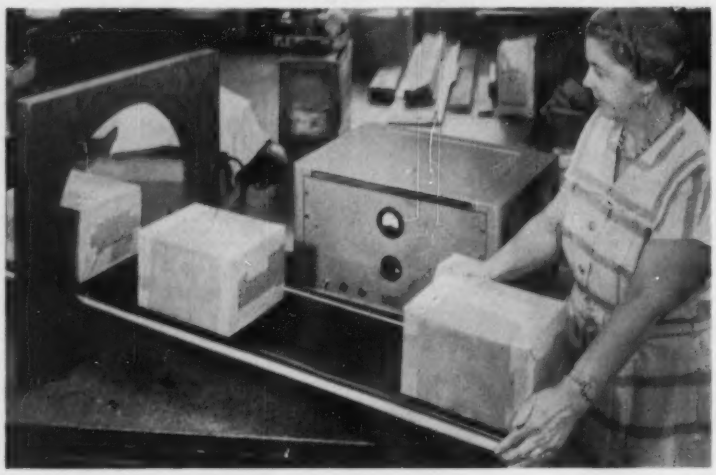
Materials-Handling Eased With Multi-Purpose Lift

Versatility built into a new lift and drum stacker is seen speeding materials handling in plants where occasional drum stacking is also required.

Known as Safeway Lift Truck, it combines forks, platform, and drum-handling attachments with a basic pedal-operated, straddle-type lift truck. For regular use its forks lift a load of 1,000 lb. to a height of 68 in. Or a steel platform can be slipped over the forks to provide a portable loading platform or elevator for small or bulky containers.

Replacing the forks with a drum-stacking attachment (by removing four bolts) enables stacking of 55-gal. steel or fiber drums weighing up to 500 lb.—*American Pulley Co., 4200 Wissahickon Ave., Philadelphia 29.*

Circle 116A on Reader Service Card



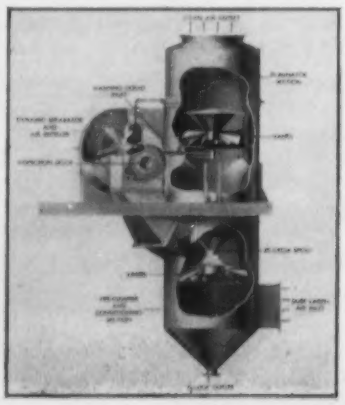
Conveyor-Line Unit Spots Tramp Metal

This detector automatically signals the presence of tramp-metal particles in non-metallic materials, either packaged or in bulk. Thus, foods may be inspected at conveyor speeds up to 1,000 fpm.

Unit (Model TM) is sensitive to both ferrous and non-ferrous particles. Contaminated material passing through the test coil actuates a reject relay that can sound a warning gong, trigger a marking device, or operate a reject gate.

Inspection apertures can be made to any convenient size and may be mounted in any position.—*J. W Dice Co., Englewood, N. J.*

Circle 116B on Reader Service Card



Dust Control Is Simplified By Efficient Air Washer

Where dust control and recovery are problems, this centrifugal air washer may provide an economical solution.

Offering unitized construction for simple installation, the washer (Type UW-4) has a wide range of applications—fine dust, abrasive material, heavy loads, and high-temperature operation. It retains constant air capacity, has low water consumption, and can be located inside or outside of a building. *(Cont'd next page)*

As shown in the diagram, dust-laden air enters the unit at the lower part of the cylinder, and initial whirling separates heavier particles. It is then directed to a first set of vanes, where additional dust is removed by descending wash liquid.

Next, air goes to the fan section and is mixed with wash liquid. Gas, liquid, and entrained dust are then discharged into the upper cylinder for final separation. Clean air leaves at the top, while sludge is removed through a bottom spout.—*The Ducon Co., 147 E. 2nd St., Mineola, N. Y.*

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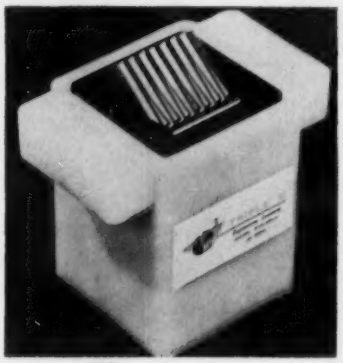


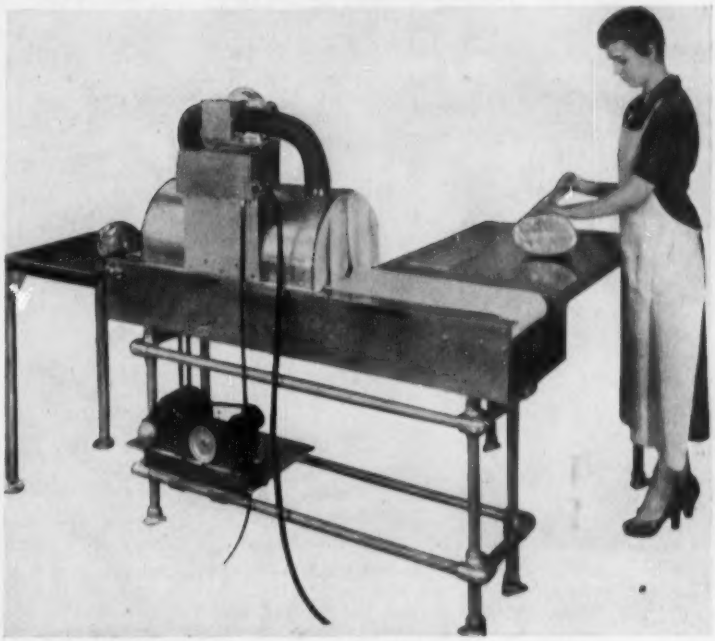
Cans Scratch-Coded By Blade-Type Unit

Employing 15 spring-loaded carbide blades, this new coder marks metal cans with inconspicuous scratches as cans pass over the blades on a conveyor.

Blades are rapidly actuated by tightening Allen screws on bottom of unit (Data-line). A binary numbering system is employed in setting the blades to provide a variety of information, such as date, batch number, and type of product. A small coding card placed alongside the scratches translates this information.

Said to cut coding costs substantially, unit is installed in the conveyor at a transfer point. Scratches are of microscopic depth, but not deep enough to endanger corrosion. Maintenance for the device entails occasional dressing of blades on a grinding wheel and application of powdered graphite.—*Triple-E Engineering Co., Racine, Wis.*

Circle 117A on Reader Service Card



Unit Shrink-Wraps Irregularly Shaped Items

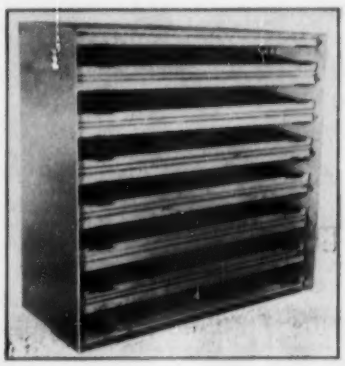
Rapid, controlled action of this new heat-shrink unit is said to eliminate wrinkles and bulges that mar the appearance of foods packaged in heat-shrinkable film. Thus even irregularly shaped items, such as meat cuts, may have the wrap seem almost molded to the product.

Unit is designed for use as a self-contained installation, or to be coupled into existing packaging lines. In operation, packages are automatically conveyed through a heat-shrink tunnel.

In the tunnel, thermostatically controlled air swirls heat around the package to shrink it rapidly and uniformly. Since items quickly pass through the tunnel, there is little change in product temperature—especially important for heat-sensitive foods.

Length of the conveyor (available in sections 5 ft. or longer) can be increased to accommodate any number of wrapping stations. Wrapping tables with inset heat-sealing plates and those for receiving finished packages are of stainless steel.—*Great Lakes Stamp & Mfg. Co., 2500 Irving Park Rd., Chicago 18.*

Circle 117B on Reader Service Card



Dry-Type Air Filter Offers Wide Operating Range

High efficiency, low maintenance cost, and design simplicity are advantages cited for a new dry-type air filter with renewable media.

The standard 7-pocket unit (Multi-Pak) is 2 ft.x2ft.x22½ in. and contains about 50 sq. ft. of filter surface. Degree of air cleaning is regulated by use of various media ranging from cellulose fiber sheets to glass fiber mats. Available in a variety of thicknesses, densities, and tex-

New Revolutionary Steam Trap

One large capacity seat for all pressures!

New Sarco Thermodynamic steam trap. Sizes ⅜ to 1"... each body as small as a tee fitting! Capacity is determined, not by a bulky body, but by the effective orifice, valve action, pressure drop and condensate temperature.

1. Cuts trap inventory

With the revolutionary Sarco TD steam trap, you use exactly the same trap... with exactly the same large capacity seat... for all pressures 10-600 psi... for heavy, light or no condensate load. Sizes ⅜ to 1".

2. All pressures 10 to even 600 psi!

...without changes or adjustments. Self-adjusting. High pressure construction... at a low pressure trap price!

3. Operates perfectly when pressure fluctuates

Absolutely no effect even from 600 to 10 psi! No water seal to evaporate. No adjustments.

4. Widest capacity range

Same large capacity seat for 10 as for 600 psi. Pressures of incoming air and condensate INSTANTLY AND FULLY raises valve head (disc), permitting maximum discharge.

5. Operates equally well on all loads

The same Sarco TD trap for heavy, light or no condensate load. No prime to lose. No adjustments.

6. No oversizing worries

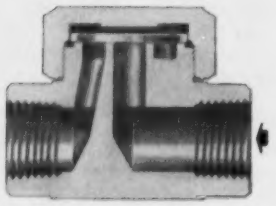
You can size the new Sarco TD steam trap for peak condensate loads... without risk of blowing steam on light loads... no prime to lose... no adjustments.

7. No steam leak required

...to operate the revolutionary Sarco TD steam trap (Pat. Pending). Closes tight against steam!

Convince yourself by 60-day trial... use coupon

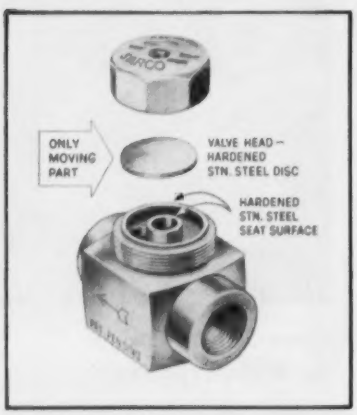
SARCO



Trouble-free design

Here is a trap so simple, it doesn't even have a valve closing mechanism. The kinetic energy of steam closes the valve. ONLY the new Sarco TD uses this operating principle.

No mechanism parts to wear or stick. No narrow channels to choke. No gaskets to leak.



Maintenance practically eliminated

The all-stainless steel Sarco TD has only 3 parts... cap, disc and body. Only moving part is a hardened SOLID stainless steel disc, practically wearproof.

SARCO COMPANY, INC.
Empire State Bldg., N. Y. 1, N. Y.

Please send me Sarco TD Steam Trap and strainer for 60-day trial.
Size_____ For use on_____

Name_____

Firm_____

Address_____

City_____ State_____

2101-B

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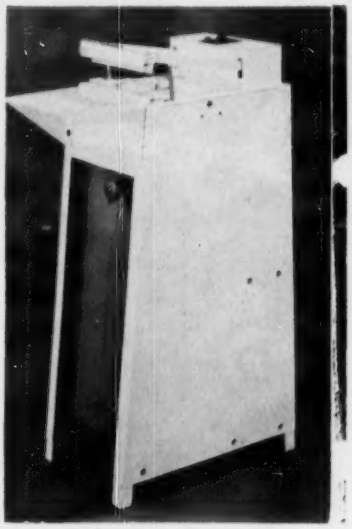
tures, they enable any desired efficiency in dust and smoke removal, even at very high temperatures.—*American Air Filter Co., 215 Central Ave., Louisville 8, Ky.*

Circle 117C on Reader Service Card



Vac-Seals Meat, Cheese In Attractive Wrappers

This unit offers the processor efficient means for extending the shelf life of pre-packaged items, such as frankfurters and sliced meat and cheese. In addition, a neat package is produced with as little as ½ in. of excess wrapper at the seal line.

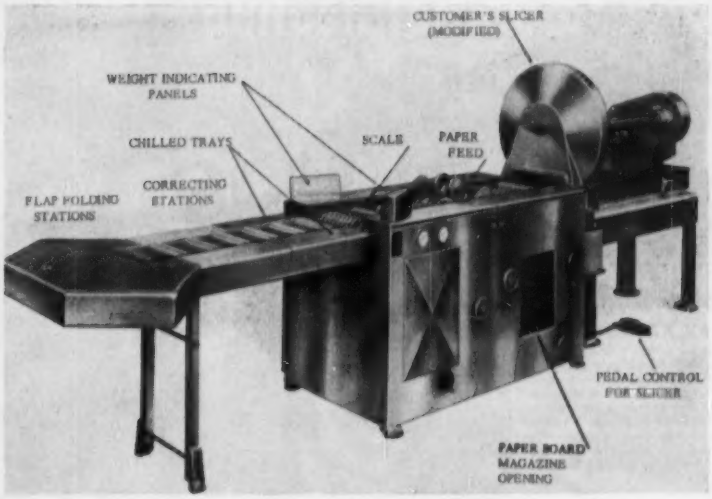
Handling packages up to 9-in. wide, unit (Model 9-TC) vacuumizes and seals 8-12 pouches per min. depending on product. Also available is a dual model that can be operated by a single worker to produce 10-14 sealed packages per min.

Pouches are loaded by any commercial device. Operator then places mouth of pouch around vacuum nozzle, latter extending to edge of product. Vacuum is drawn by depressing a foot pedal halfway.

Package is sealed when foot pedal is fully lowered. An automatic timer controls temperature and duration of heating. At end of cycle, package is removed and operator brushes out excess wrapping material.

Unit occupies 24x27½ in. of floor space, plugs into standard 110-115v. a.c. outlet. — *The Cryovac Co., Cambridge 40, Mass.*

Circle 119A on Reader Service Card



Automatic Fill Control Cuts Product Giveway

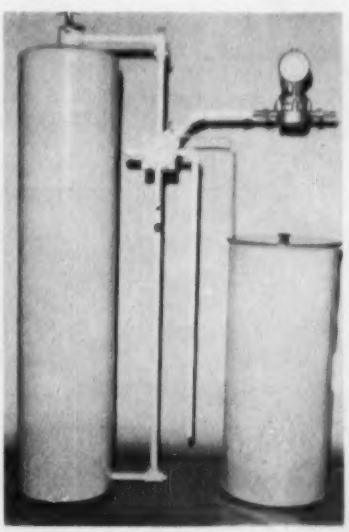
Shingled half-pound and pound packaged bacon may now be produced more economically and to closer weight tolerances on this new bacon line. Called EM-129, it automatically controls and indicates package weight to ¼ of a bacon slice.

Six operators run the unit, which consists of a slicer, a shingling conveyor, paperboard feed, indicating scale, and stations for weight correction and flap folding. Packages may then be sent to a standard overwrap machine. Improved shingling methods offer 2% greater yield of bacon as well as better product appearance.

In operation, intermittently sliced bacon falls in groups on the shingling conveyor, then is carried to a point where a waxed card is automatically inserted under each group to form a package. Most efficient operation is in the range of 10-24 slices per lb., although other slice variations are possible. Final steps are weight correction and folding the paperboard.

All major components are of stainless steel, hence are easily and rapidly cleaned with water or steam.—*Emhart Mfg. Co., Standard-Knapp Div., Portland, Conn.*

Circle 119B on Reader Service Card



Compact Water Softener— Efficient, Low-Volume Unit

Special design of this water softener, for smaller requirements, provides higher capacity and prevents loss of zeolite.

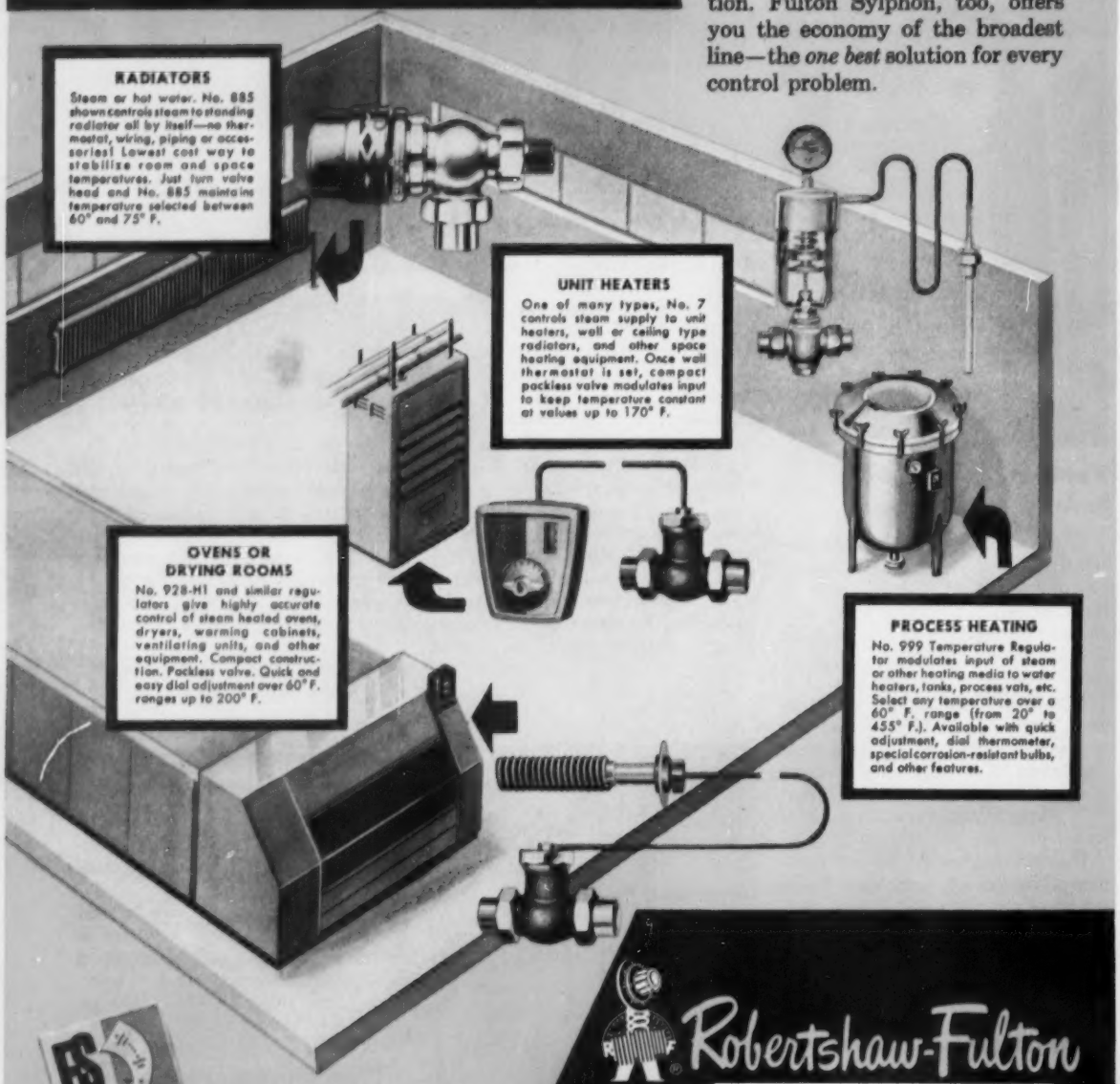
Furthermore, operation is termed simple and foolproof. A meter is wired to ring when a predetermined gallonage has been treated. Capacities range from 28,000-91,000 gr. with synthetic gel zeolite, and from 54,000-180,000 gr. by use of ion-exchange resins.

Maker's valve (Multiport), bell alarm meter, and brine tank are standard equipment. Softener sizes: 10x54 in., 12x54 in., 16x54 in., and 18x54.—*Elgin Softener Corp., Elgin, Ill.*

Circle 119C on Reader Service Card

How to control heating AT LOWEST COST all around the plant

Whichever way you heat or cool processes and people, the temperature control that costs less to buy, operate and maintain is a Fulton Sylphon Temperature Regulator. The reason is the simple, foolproof SYLPHON® BELLOWS construction which accurately adjusts input at the same time it permits unusual simplicity and self-powered operation. Fulton Sylphon, too, offers you the economy of the broadest line—the *one best* solution for every control problem.



RADIATORS

Steam or hot water. No. 885 shown controls steam to standing radiator all by itself—no thermostat, wiring, piping or accessories! Lowest cost way to stabilize room and space temperatures. Just turn valve head and No. 885 maintains temperature selected between 60° and 75° F.

UNIT HEATERS

One of many types, No. 7 controls steam supply to unit heaters, wall or ceiling type radiators, and other space heating equipment. Once wall thermostat is set, compact packless valve modulates input to keep temperature constant at values up to 170° F.

OVENS OR DRYING ROOMS

No. 928-H1 and similar regulators give highly accurate control of steam heated ovens, dryers, warming cabinets, ventilating units, and other equipment. Compact construction. Packless valve. Quick and easy dial adjustment over 60° F. ranges up to 200° F.

PROCESS HEATING

No. 999 Temperature Regulator modulates input of steam or other heating media to water heaters, tanks, process vats, etc. Select any temperature over a 60° F. range (from 20° to 455° F.). Available with quick adjustment, dial thermometer, special corrosion-resistant bulbs, and other features.

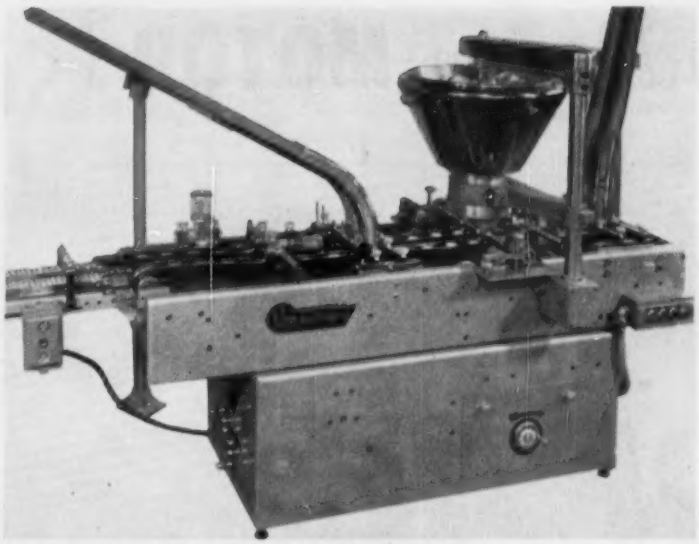
SEND TODAY FOR CATALOG E-VG

Robertshaw-Fulton CONTROLS COMPANY

FULTON SYLPHON DIVISION

Knoxville 1, Tennessee

FULTON SYLPHON • TEMPERATURE REGULATOR HEADQUARTERS, U.S.A.



Forms Cookie Sandwiches at 1,400 per Min.

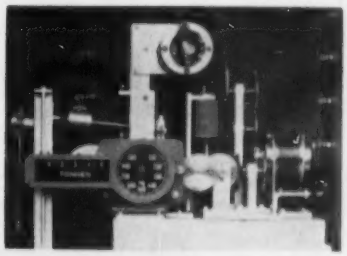
Fully automatic, this cookie or cracker sandwich machine operates at speeds up to 1,400 per min.

It makes a variety of sandwiches—square, round, rectangular, finger-shaped, oval, and half-round—with fillings such as creams, cheeses, or peanut butter. Changeover from one shape to another is accomplished with simple adjustments.

Unit feeds base cakes to conveyors, applies filling, and positions top cakes to complete the sandwich. Twin conveyors deliver finished goods stacked in two rows, or counted and grouped.

Base cakes are fed directly from the oven cooling conveyor, thus eliminating double handling and storage of cakes. However, they may also be fed from boxes.—*Peters Machinery Co., 4700 Ravenswood Ave., Chicago.*

Circle 121A on Reader Service Card



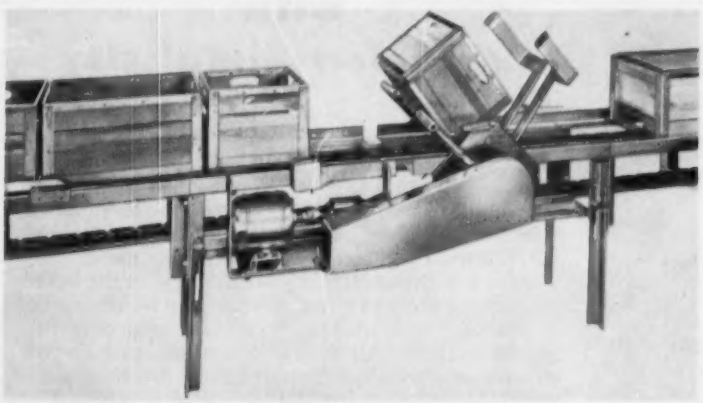
Belt Weigher Provides Remote Operation

Shown above is the computer of a new Dutch unit designed to weigh material moving along a conveyor. A typical food application is recording the flow of cereals.

The scale has a special indicator employing a differential gear-wheel system. It computes the weight of materials handled, and can be provided with a counter or print tabulator. One set of rollers on which the belt moves is suspended by a series of levers recording the load passing over it. Remote reading is possible at several places simultaneously. Unit may also be equipped with automatic remote-recording on either paper or cards, and an electronic switch-off device.

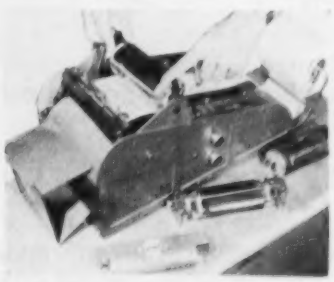
Scales are available for varying loads, but minimum weight of at least 7 lb. per ft. is required on the belt at any given point.—*Eerste Nederlandse Fabriek van Weewerktuigen, Breda, Holland.*

Circle 121C on Reader Service Card



Milk-Case Inverter Cuts Handling Costs

A new labor-saving device for the dairy, this unit (LP Case Inverter) automatically inverts cases for effective washing. Electronically controlled for smooth continuous performance, it fits into any conveyor line, operates at variable speeds, and handles all sizes and types of cases. Another unit uprights them after washing.—*Lathrop-Paulson Co., 2459 W. 48th St., Chicago 22.* Circle 121B on Reader Service Card

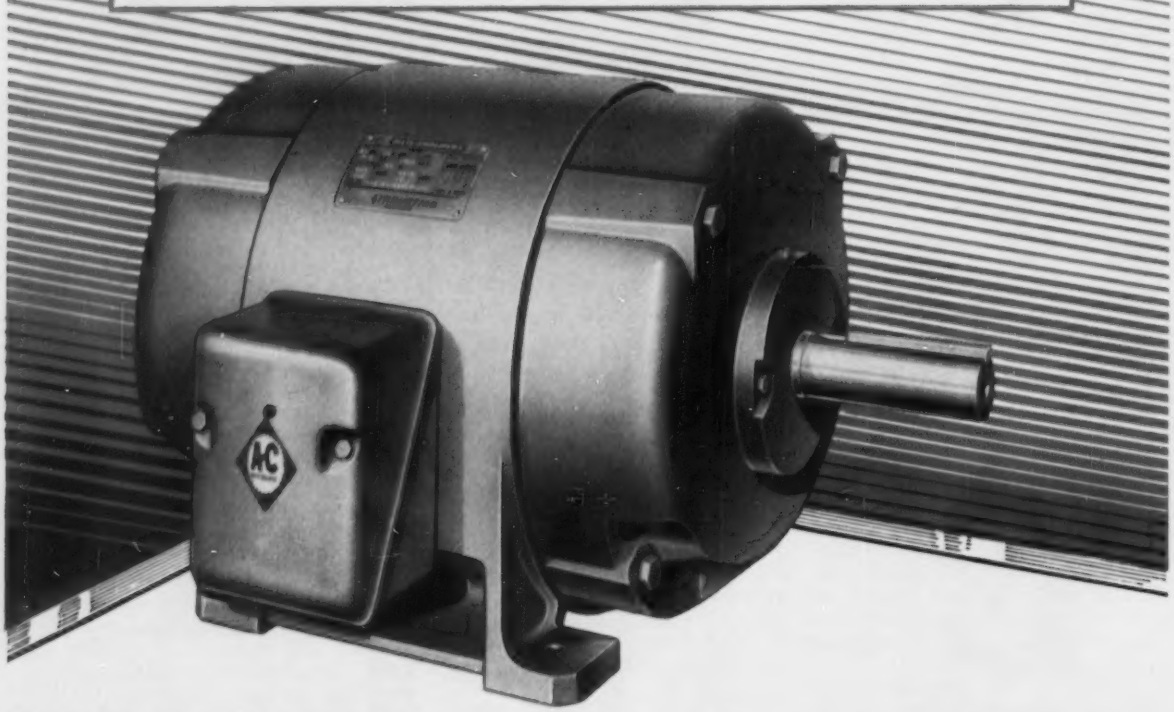


Prints Labels as Needed, Applies Variable Data

With this automatic unit, processors can print their own product-identification labels as needed, thus eliminating inventory problems.

Known as Model 80, it uses inter-

NEW *Synduction* MOTOR



Do you have an Application Requiring . . .

. . . **Constant speed, regardless of load or voltage, depending only on frequency.**

. . . **Synchronized speed for a number of motors.**

. . . **Adjustable speed with minimum variation at any speed setting.**

Synchronous Speed with Induction Simplicity

Allis-Chalmers new development — the *Synduction* motor — offers these characteristics at low cost — with the dependability of an induction motor. In addition to constant speed from no load to pull-out, it also offers across-the-line starting, wide range of speeds and high efficiency. It's another example of MORE motor pioneering by Allis-Chalmers.

Allis-Chalmers invites your inquiry, in the belief that many processes can be improved by the application of *Synduction* motors. Our engineers will gladly analyze your present operations to help you determine where *Synduction* motors can be applied profitably. Call your A-C office or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin, for Bulletin 51B8440.

Synduction is an Allis-Chalmers trademark.

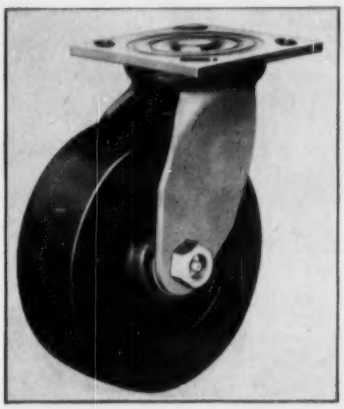
A-5115

ALLIS-CHALMERS

changeable rubber type to produce 105 labels per min. Typical data include size, weight, color, and date. In addition, the printing head can be replaced with a stencil drum for printing small forms such as shipping labels and packing slips.

Various types of labels ranging from ½x2 in. to 4½x6 in., are printed with waterproof inks that dry immediately. A pre-set counter records the number of labels produced and shuts off the unit at the end of a run. Machine measures 9x20x11 in., weighs 44 lb.—*Weber Marking Systems, Mt. Prospect, Ill.*

Circle 121D on Reader Service Card



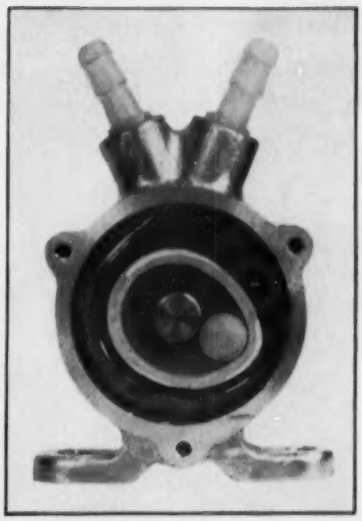
New Caster Is Sealed Against Dirt, Rust

Termed particularly applicable in food-processing plants, this new caster employs lip-type Neoprene seals to protect swivel races and wheel bearings against dirt and corrosion. Available with steel, plastic, V-groove, and mold-on rubber wheels, it also permits use of full rollers, thus maintains maximum load rating on all types of wheels.

Seals are held firmly in place in separately machined grooves, and are vulcanized on inner edges of retaining washers. This construction affords purging of all bearings with conventional greasing equipment. Constant-lip contact of the sealing does not bind rotation.

As bearings wear or heavy loads shift on casters, the flexible lip "works" up to 3/32 in. to compensate for gap variations.—*The Colson Corp., Elyria, Ohio.*

Circle 123A on Reader Service Card



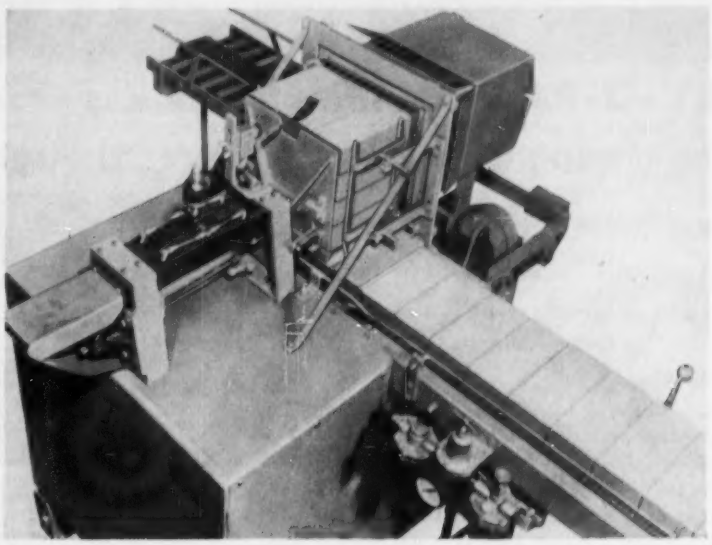
New Hose-Type Pump Has Sanitary Design

Efficient operation, design simplicity, and versatility are reported for this self-priming sanitary pump for flow rates up to 19 oz. per min.

Known as Model 40, it employs a nylon roller for planetary kneading action, vinyl tubing, and nylon tube fittings. These are the only parts contacting material being pumped. Maintenance is cut since there is no stuffing box, and all components are easily accessible.

Powered by a 1/25-hp. motor, unit handles a variety of fluids, chemicals, and slurries. With aluminum body and end cover, it weighs about ½ lb.—*Becher Pump Co., 852 Belmont Ave., Chicago 14.*

Circle 123B on Reader Service Card



Automatically Cases 160-220 Packages/Min.

Here's a new automatic caser designed to load virtually any product packaged in a rigid or semi-rigid container. Typical items: Frozen foods, dried fruit, rice, beans, and cereals.

Called "Sure-Way", its capacity ranges from 160-220 packages per min., depending on carton size and casing pattern employed. Unit consists of a feed conveyor, assembly-casing mechanism, and a discharge conveyor.

In operation, cartons are fed to assembly-casing mechanism by a continuous conveyor, on which twisters and positioning devices may be incorporated for aligning them to fit any established casing pattern. When discharged from feed conveyor, they are assembled to form a casing tier and placed into feed end of a loading tube.

As each newly formed tier enters tube, another moves into a case placed on tube's discharge end. When case is filled, it is automatically lowered onto a discharge conveyor by means of a supporting

IF YOU BREAD FISH, MEATS OR SEAFOOD

Close up of uniform batter coverage and feed to Breader.

FRY-O-PAC EQUIPMENT makes processing faster, less expensive than you ever thought possible.

What Greer Fry-O-Pac Equipment can do for you!

Increase production!

3 to 5 times over hand breading.

Cut Cost!

Quickly pays for itself. Users report up to $60 daily savings in breading material alone. Lump loss eliminated . . . Absolutely no dripping . . . Less product breakage.

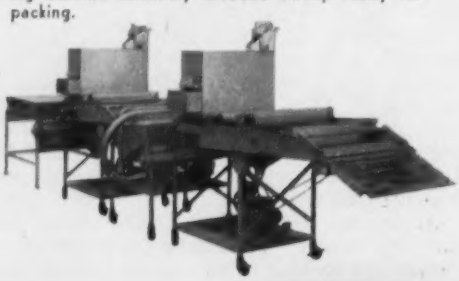
There is a GREER automatic Batterer and Breader designed for your product. Fry-O-Pac equipment dips and breads all types of sea foods, meats **(fresh or frozen)** and poultry . . . from delicate oysters and fantail shrimp to odd shaped poultry and meat pieces.

Have you investigated the Continuous Multi-Tier Freezer?

Close up of delivery end of Breader showing double patting device — an exclusive feature with Greer.

For Shrimp Packers

The Fry-O-Pac shrimp breading line. Boosts shrimp breading capacity up to 150 pounds/hour per worker (raw product). Smooth gentle processing delivers uniformly breaded shrimp ready for packing.



J. W. GREER COMPANY

WILMINGTON, MASSACHUSETTS

Sales Engineering Offices: Chicago, Ill., and San Francisco, Calif.

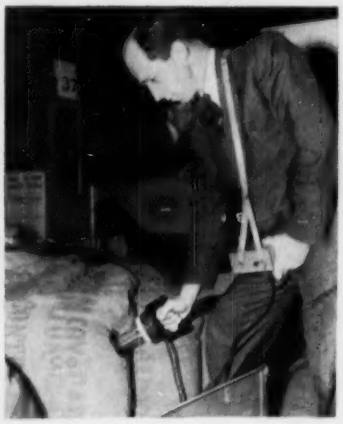
GREER

lowerator arm. Subsequently, it is transferred to a case sealer.

Gentle and positive handling of packages in this system offers maximum package protection. While unit is furnished for specific-size containers and patterns, certain combinations can be achieved by minor adjustments. Only one operator is required—for placing empty cases on loading tube.

Machine is 11 ft. 6 in. long, 5 ft. 7 in. wide, and 5 ft. 4 in. high. It employs a ¼-hp. motor operating on 3 phase, 60 cycle, 220/440 v., or 110 v., 60 cycle, 1 phase.—*Food Machinery & Chemical Corp., Canning Machinery Div., San Jose, Calif., or Hopkinston, Ill.*

Circle 123C on Reader Service Card



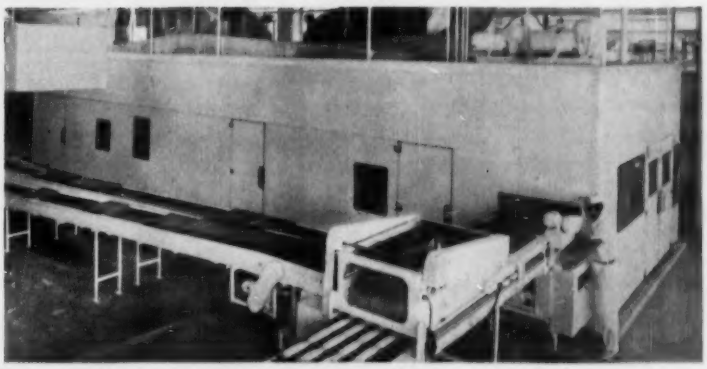
New Moisture Meter Eliminates Sampling

This new instrument measures the moisture content of grain in bulk and in sealed sacks, without the necessity of sampling.

Called ScotMec-Oxley, it comprises a probe unit and a special ohmmeter with built-in 500-v. generator. To take a reading, its nine spear-like probes are thrust through the sack, then a handle is turned and grain's moisture content instantaneously registers on the dial. A temperature-correcting device is attached to the instrument case.

A moisture determination takes 5 sec., hence a whole load of grain can be checked within minutes.—*Scottish Mechanical Light Industries Ltd., Ayr, Scotland.*

Circle 125A on Reader Service Card



Automatic Proof Box Offers Operating Flexibility

Employing a new rack-pullout mechanism, this adjustable proof box permits continuous runs of several varieties of bread doughs requiring different proof times—without under- or over-proofing during changeover.

Panned dough travels on a conveyor into the proof box (Flexoflow), where it is automatically loaded onto multi-shelf racks and carried around the proofing circuit. To decrease proof time, the mechanism pulls one or more empty racks from the circuit and shunts them into a rear storage compartment. Conversely, proof time is increased by restoring racks to the circuit.

Therefore, a change of proof time does not affect proofing of racks ahead of those being removed. Hence, each dough piece is proofed as required.

Racks are loaded and unloaded by sweep bars which push a row of pan straps onto a shelf in a single motion, and empty a shelf in the same manner. A cycle begins at the lower level, and the rack moves upward by indexing one shelf at a time until all shelves have been unloaded and reloaded. Then, the rack starts to travel through the box. Pan straps discharged from the rack are pushed onto a conveyor and carried to the oven.

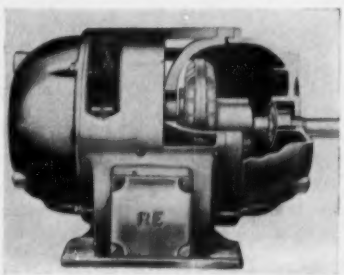
Two concentric rows of push-buttons on a rotating disk control flow of racks in and out of storage chamber. A set of indicator buttons shows whether racks are loaded or emptied. Temperature and humidity inside the box are continually controlled and recorded.

Non-stop operation is provided by a dual-control system. Should electrical failure occur, operator merely switches over to the duplicate control circuit while the trouble is located and repaired.

As an aid to the maintenance man, a red light flashes on the panel board to indicate where electrical failure occurs. Main control panel also flashes green lights to show the sequence of operations in the proof box.

To ease sanitation, a bank of water sprays eliminates manual rack washing.—*Read Standard Corp., York, Pa.*

Circle 125B on Reader Service Card



Versatile Motor Employs New Internal Coupling

Supplied as a single-frame package, this new motor uses a dry-fluid coupling, an adaptation of the Dodge Flexidyne drive. Units are produced in ½-15 hp. ratings.

Known as Flexi-Shaft, it offers smooth load acceleration, protection against equipment jamming, and

EXACT WEIGHT Scales guard the profits in frozen cuts

THE EXACT WEIGHT SCALE, in use above, is used extensively by Meat Packers and Processors for weighing cuts of meat, steaks, roasts, etc. for freezing. Also adaptable to many other products and uses, the end tower design allows uninterrupted straight line production across the scale. Very short lever fall and an adjustable hydraulic damping action bring indicator to rest quickly—for a fast and accurate reading. Indicator travel of 1¾ inches equals 1¼ ounces over or under established weight. Optional dial graduations available.

Model 273, above, has a 12 lb. capacity and is equipped with a 1 lb. beam, weight platter and counterweights. It is instantly adaptable to various products of different weights. To change the weight, simply change the counterweight.

EXACT WEIGHT manufactures over 800 model scales in a wide range of weight capacities and visual sensitivities. Especially designed for fast, accurate weighing and check-weighing in today's food engineering plants, there's an EXACT WEIGHT model to fit your needs and your product.

Consult us on your weighing problems

Model 213, left, has a 3 lb. capacity. Compactly built for use where space is limited, it is unaffected by machinery vibration and weighs accurately in out-of-level position.

Exact Weight Scales

Better quality control

Better cost control

THE EXACT WEIGHT SCALE COMPANY

910 W. Fifth Avenue, Columbus 8, Ohio

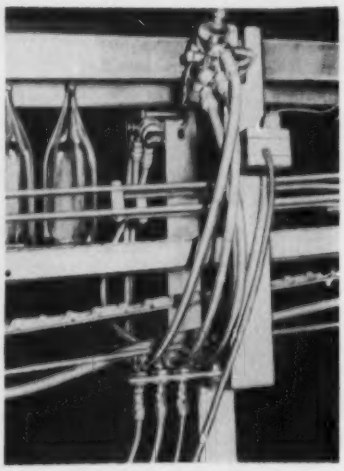
In Canada: P. O. Box 179, Station S, Toronto 18, Ont.

Equipment & Supplies

lower power consumption in starting heavy loads. Many combinations with magnetic brakes and gear reducers are available to solve unique drive problems.

The dry-fluid coupling, mounted inside the motor frame, uses steel shot instead of true fluid. Its operating principle is based on centrifugal force throwing the shot to the housing perimeter. Latter, in turn, is keyed to the load and accelerates as rotor gradually becomes imbedded in the tightly packed shot.—*Reuland Electric Co., Alhambra, Calif.*

Circle 125C on Reader Service Card



In-Plant Coating Process Ups Glass-Bottle Life

Appearance and strength of glass bottles may be boosted by a nontoxic protective coating applied to containers—in the user's plant—after each trip.

The outside of a bottle is coated from the shoulder down with a modified silicone (Nu-Glas) that is adsorbed by the wet glass surface. No heat treatment is required, none of the coating goes inside the neck, and surplus material can be rinsed off with cold water. Tests indicate no interference with bottle sterility.

Coating unit (photo) is installed on the bottle conveyor and can be adjusted laterally or vertically. As a safety device, an automatic shut-off valve instantly stops the coating operation if unit is not properly set for a given bottle height. Pressure-regulating and filtering equipment are provided and spray head are self-cleaning.—*Thatcher Glass Mfg. Co., Elmira, N. Y.*

Circle 126A on Reader Service Card

Many extra advantages at no extra cost with this low-pressure pipe covering

Insulating efficiency of ½" thick Armaglas* Low-Pressure Covering is equal to or better than ¾" or 1" thickness of ordinary materials. Lightweight, thin wall design speeds handling and saves space in crowded quarters. Tough glass fiber composition eliminates cracking and crumbling during application. High shrinkage resistance keeps joints tight and neat looking. White vapor barrier jacket needs no further finishing on cold water, hot water, or low-pressure steam lines. Made in molded half sections for pipe and tubing to 12".

Armaglas is one of the quality products in the complete line of Armstrong Industrial Insulations. Armstrong also offers you a complete contracting service, geared to install these products economically and efficiently.

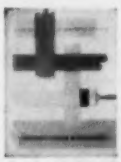
For complete information on Armaglas, send for free booklet. Booklets on other Armstrong Insulations also supplied on request. Check the ones you want on the coupon below.

* Trade-Mark. Manufactured for Armstrong by Owens-Corning Fiberglas Corp.

Armstrong

INDUSTRIAL INSULATIONS

☐ Armstrong Armaglas Insulations for Pipes, Tanks, and Vessels



☐ Armstrong Insulcolor®, Weatherproof Coating in Eight Colors

☐ Armstrong LT Cork Covering, a New Type Cold Line Insulation

☐ Armstrong Armaflex**, a New Flexible Insulation for Piping

**TRADE-MARK

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2011 Seventh St.
Lancaster, Penna.

Please send me the free booklets checked.

Please have an Armstrong representative call. ☐

Name .....

Position .....

Company .....

Address .....

City ..... Zone .... State .....

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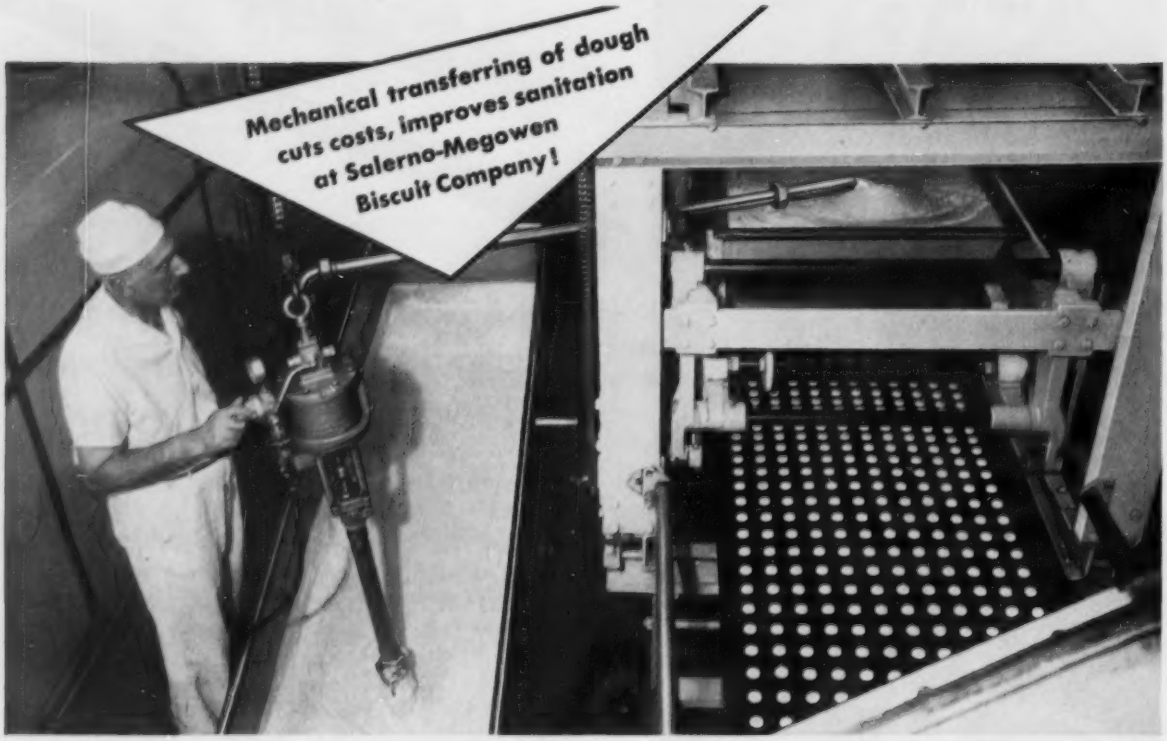
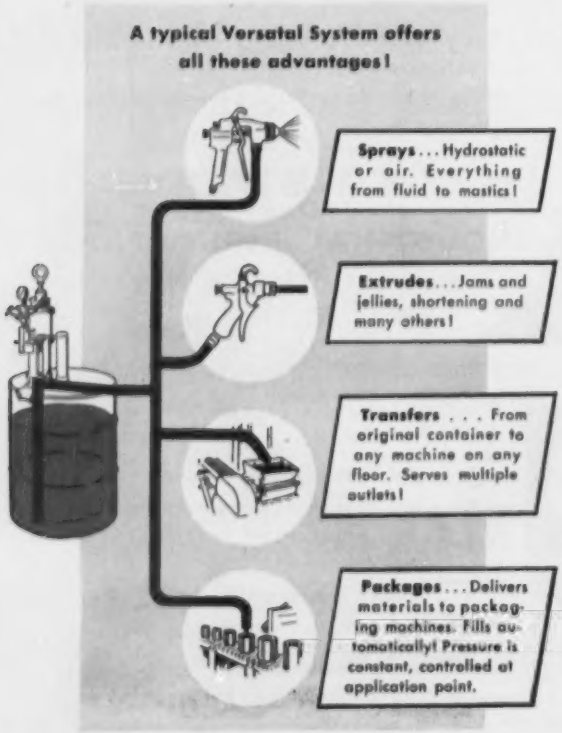


ALEMITE VERSATAL PUMP

saves labor, time and material


A typical Versatal System offers all these advantages!
Sprays... Hydrostatic or air. Everything from fluid to mastics!
Extrudes... Jams and jellies, shortening and many others!
Transfers ... From original container to any machine on any floor. Serves multiple outlets!
Packages... Delivers materials to packaging machines. Fills automatically! Pressure is constant, controlled at application point.

Transferring vanilla wafer batter from the trough to this huge cookie-making machine by hand kept two operators busy full-time at the Salerno-Megowen Biscuit Company of Chicago. Now, with a powerful Alemite Versatal Pump, only one operator is required—*and he does the job much easier, in less time!*

Mechanical pumping with the Alemite Versatal System has assured more sanitary handling of material. With the elimination of hand methods, the hopper can be covered with a dust-proof lid—floors are kept clean and dry. Quality control is improved, because there is a constant, even supply of dough, without interruptions for refilling.

This is just one of many ways Alemite Versatal systems are saving money and improving sanitation in food plants everywhere. Let these modern, efficient pumps go to work for you!

Alemite Versatal Pumps Handle Dough, Lard, Shortening, Cake Icing, Jellies, Jam, Syrups, many others!

STEWART SW WARNER

ALEMITE Versatal SPRAY-PUMP EQUIPMENT

For full details, contact your nearest supplier or write Alemite, 1830 Diversey Parkway, Chicago 14, Ill.

Products of STEWART-WARNER CORPORATION

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Equipment & Supplies

Sanitary Floor Truck Resists Corrosion

Designed to boost food-plant sanitation, this bin-type truck will not corrode or absorb odors.

Units are available in stainless, galvanized steel, or aluminum, and in a variety of sizes. Most common is 4 ft. long, 3 ft wide, 2 ft. deep.

The top has continuous rolled edges and two corrugations that circle the box to stiffen it. Bumpers on front and back prevent damage. Roller-bearing 12-in.-dia. center wheels and 8-in.-dia. rigid end wheels offer easy pushing.

A corrugated bottom (photo) to make the truck self-draining is optional. — *Lewis-Shepard Products, Inc., Watertown, Mass.*

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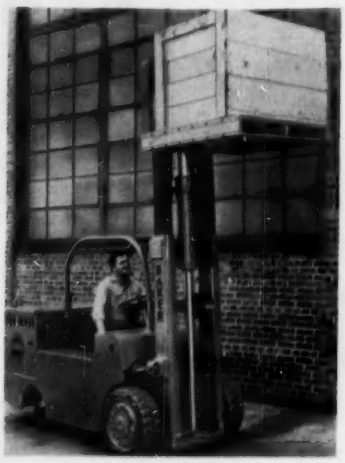
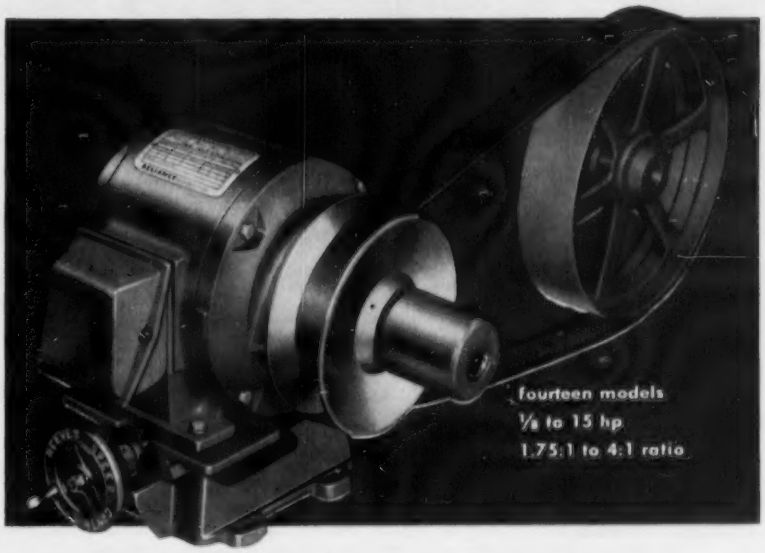


Truck's Low Silhouette Ups Operator Safety

Developed for operator safety in loading closed highway trucks and trailers, this new 6,000-lb. electric fork truck needs only 6 ft. of clearance. Operator's seat is 38 in. below the top of the mast, thus danger of his head striking the low overhead is eliminated.

In addition, unit (Type FTDL-

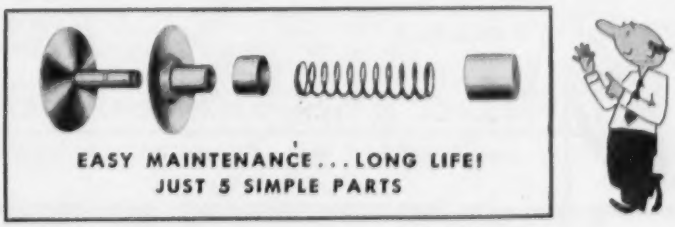
The low-cost answer to wider use of your machines



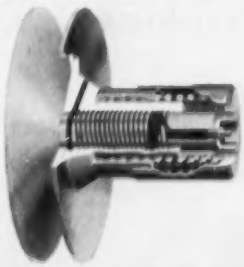
REEVES

Vari-Speed Motor Pulley

Add the advantages of accurate variable speed control to your existing machinery with this compact unit. Add versatility and extended life . . . handle more shapes, sizes and materials!



REEVES "Close-grooving" —a special lubrication system—insures free sliding disc for easy speed changes.



For bulletin complete with rating charts and dimensions, write Dept. FE21b-V545.

REEVES PULLEY COMPANY
Division of **RELIANCE** ELECTRIC AND ENGINEERING CO.
Columbus, Indiana

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Mr Gene Lane, Utility Operator, at the Central Soya Co., Inc., Chattanooga, Tenn. plant, operates 36 Merchen Scale Feeders that blend feed ingredients to 1% accuracy.

MERCHEN SCALE FEEDERS

"give us accurate, continuous blending over a wide feed range"

Central Soya Co., Inc., blends millions of bags of animal and poultry feed a year at their new Chattanooga plant. Up to 50 different formula feeds are produced to exacting standards. Central Soya chose **W&T** Merchen Feeders because they give 1% minute-to-minute accuracy over a wide feed range. As seen in the picture, the feeders are compact — with no bulky enclosures.

Merchen Scale Feeders, with feed rates from 3 to 3000 pounds per minute, require no adjustment for changes in material density. They are suited for most industrial continuous blending or automatic batching processes. For more information about Merchen Scale Feeders, write for Bulletin M-34.

WALLACE & TIERNAN INCORPORATED

25 MAIN STREET BELLEVILLE 9, NEW JERSEY

CHLORINATORS and CHEMICAL FEEDERS

for
- **slime elimination**
- **water treatment and purification**
- **industrial waste and sewage treatment**

WALLACE & TIERNAN INCORPORATED

25 MAIN STREET, BELLEVILLE 9, NEW JERSEY

CD-41

Equipment & Supplies

60) is said to have high stability, ease of maintenance, and provision for maximum operator comfort. Absence of a cowl permits a good view of the load and the floor immediately ahead of the truck. It also makes for easier mounting and dismounting. Also, floor plate is clear of obstructions for the same purpose. Automotive-type controls, including those for auxiliaries, are conveniently located and easily operated.

Truck has three braking systems. Service brakes are hydraulic, self-energizing, and self-equalizing, while parking brake is actuated by the spring seat. Unit also has dynamic braking, which prevents abrupt reversal of direction while truck is in motion. Overall height is 68 in., maximum lift is 97 in., and travel speed (with load) is 4 mph.—*Baker-Raulang Co., 1250 W. 80th St., Cleveland 2.*

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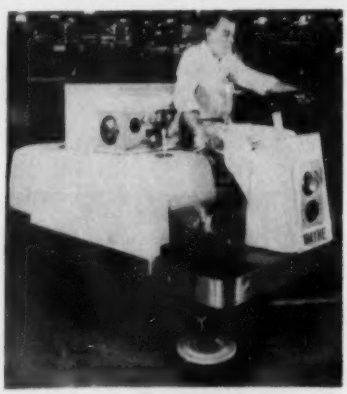


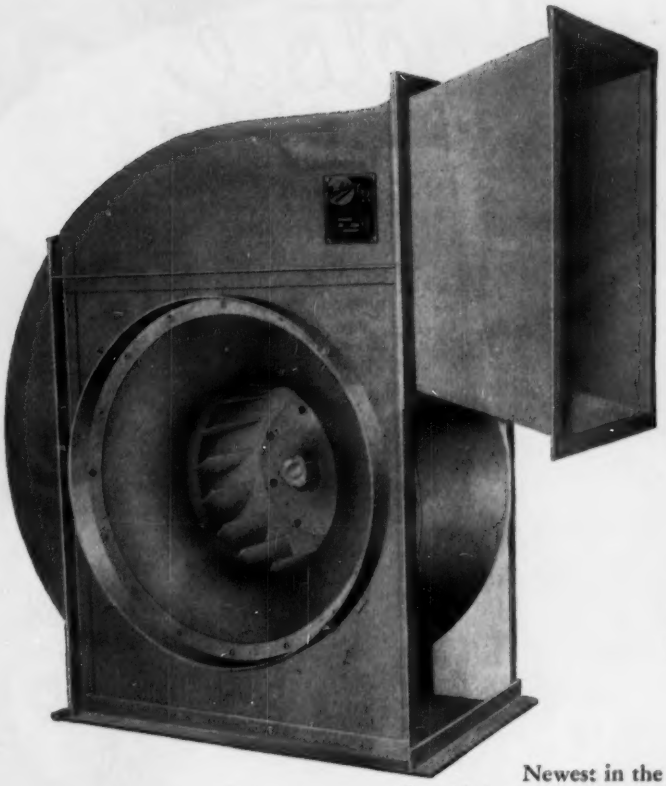
Batteries Power Sweeper For Full 8-Hr. Shift

Here is a new battery-powered unit designed to sweep 70,000 sq. ft. per hr., and to work an 8-hr. shift without recharging.

Called Model 605-E, it operates on two motors, one powering the vehicle, the other for brooms and dust-control systems. Only one motor is used when unit travels but does not sweep, thus conserving the batteries. Latter are recharged from any 110-v. outlet.

The 36-in. broom is mounted on self-aligning, sealed ball bearings. Pressure adjustment, within reach of operator, permits maximum sweeping under either heavy or light conditions, with minimum broom wear.

Side brooms are available for left, right, or both sides. Basic sweeping



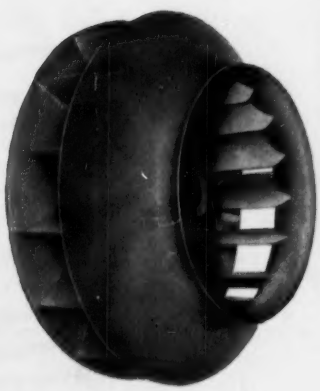
NEW

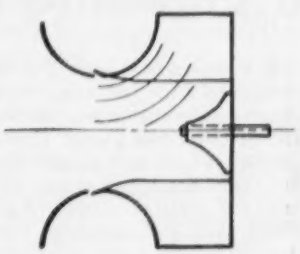
"BUFFALO" TYPE "CR" RADIAL BLADE FAN

Engineered for Your High-Volume High-Pressure Jobs

Newest in the complete line of "Buffalo" Fans, the Type "CR" offers high mechanical efficiency (above 78%) over a broad range, and has high-pressure, high-volume characteristics that make lower first cost possible on many applications. It is also highly suitable for handling dust-laden air efficiently.

In the illustration of the "CR" wheel, you will note the deeply pressed, curving flange. It provides rigidity and meets the curved inlet bell to form a true half-circle air entry path into the wheel (shown in cross section diagram). Wheel blades are radial at tip, curving smoothly forward at inlet. The streamlined housing with divergent outlet further minimizes abrasive effects and aids efficiency by reducing turbulence. While "Buffalo" builds other type fans of higher efficiency than the "CR", its highly desirable balance of favorable first cost, high efficiency and long life assure substantial overall savings in heavy industrial service. Write for new Bulletin FD 205 and see the "Q" Factor* features built into this quality fan.





**The "Q" Factor — the built-in Quality which provides trouble-free satisfaction and long life.*

BUFFALO FORGE COMPANY

BUFFALO, NEW YORK

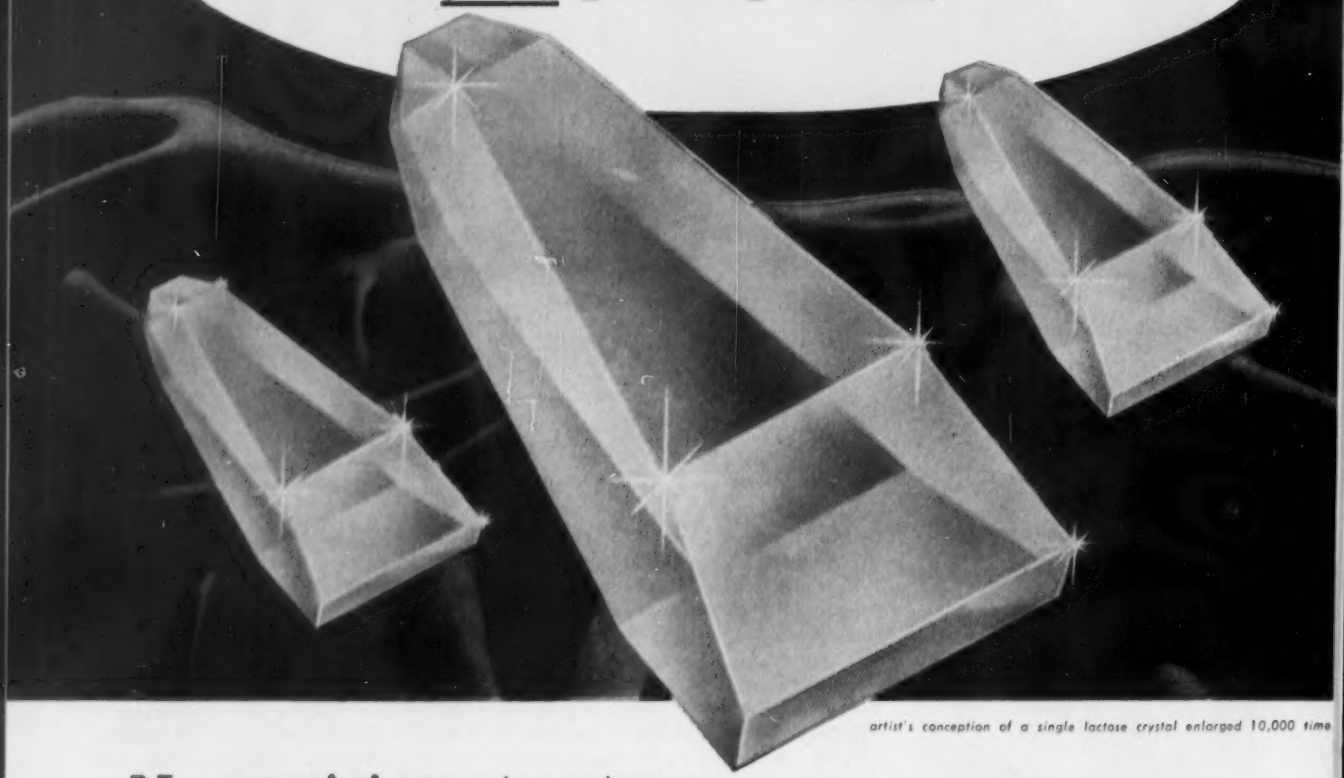
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

"Buffalo"

VENTILATING AIR CLEANING AIR TEMPERING INDUCED DRAFT EXHAUSTING FORCED DRAFT COOLING HEATING PRESSURE BLOWING

For more data, circle this page number on card at back →

Chances are lactose can put more Sparkle in your profit picture, too!



artist's conception of a single lactose crystal enlarged 10,000 time

New pricing structure opens hundreds of doors to versatile milk sugar

• Yes, there's a new lower pricing structure on Western Condensing's lactose. And it's another reason so many forward-looking firms are paving the way to bigger profits with this versatile milk sugar.

Hundreds of new users . . . on all kinds of operations . . . are using lactose to replace all or part of carbohydrates previously used . . . because lactose provides many of the desirable properties of other sugars — plus many profit-promoting benefits found only in pure milk sugar.

Food, drug and industrial users are enthusiastic about the way lactose improves quality and performance of their products. Chances are its superior qualities will pay off for you, too. Write today for samples, prices and detailed information on the advantages you can expect from lactose.

Here are typical Lactose benefits for the Food Industry

- tenderizes
- browns and carmelizes
- enhances flavor
- adsorbs color pigments
- holds freshness
- aids in dispersing
- aids in spray drying
- prevents crystalization
- promotes free-flowing characteristics

Western Condensing's efficient mass production techniques assure still further benefits . . . uniform high quality . . . high purity . . . unlimited supply. Available grades: U.S.P., Edible and Crude.

FOREMOST lactose

WESTERN CONDENSING COMPANY

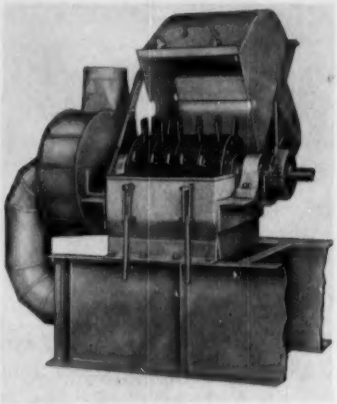
Appleton, Wisconsin

A WORLD-WIDE SUPPLIER OF HIGH-QUALITY MILK DERIVATIVES

swath is 36 in., but it can be increased to 60 in. by addition of two slide brooms. Sweeper has 3-speed forward transmission and one speed in reverse, which provides gear ratios for efficient operation.

Also included is a special dust control (Filter-Vac) that eliminates need for a dust bag. Dust is deposited in the main dirt hopper before entering the fan. When full, the hopper-load is hydraulically dumped in a compact pile, without the driver leaving his seat.—*Wayne Mfg. Co., 1275 E. Lexington Ave., Pomona, Calif.*

Circle 130A on Reader Service Card



Flexible Grinding Offered By New Hammermill

Adjustable arrangement of hammers in this new mill enables it to handle a wide range of grinding and size reduction. Moreover, pushbutton operation permits remote control.

There are two rows of holes in circles on rotor plates. By placing hammers on the outside row, which increases hammer tip speeds and cuts clearance between screen and hammers, both fine and finished grinding are provided.

For coarser grinds, fewer but larger hammers are used. They are attached to the inside row of holes by pins. This gives slower tip speed, greater clearance, and fewer impact points to produce large, uniform particles.

An alloy steel shaft (5¾ in. dia.) is used for the rotor, which is designed to operate at a hammer tip speed of about 25,000 ft. per min. Alignment problems are eliminated

LIGHT . . .

ELECTRICAL RIGID CONDUIT, made by Alcoa, is light and strong. It goes up easier and faster . . . with less man power, lighter supporting members. It's easier to handle, transport, store. You can bend, thread and cut it with present equipment.

Once you understand *all* the advantages of rigid conduit made from Alcoa® Aluminum, you'll not be satisfied with anything else.

It's good looking . . . presents a cleaner, more attractive appearance.

It resists corrosion. Weather, moisture, general industrial fumes and other unfavorable conditions can't destroy it or mar its good looks.

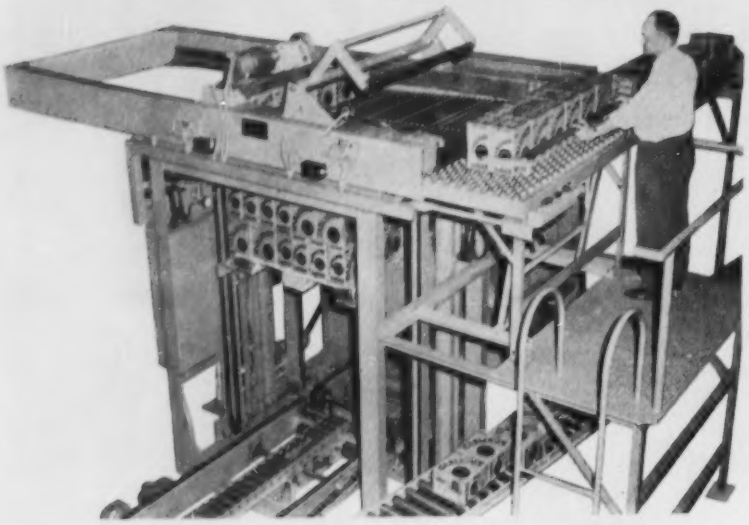
It's nonmagnetic, nonsparking . . . has Underwriters' Laboratories approval. Because it is nonmagnetic, there's less voltage drop. Longer runs are practicable . . . or smaller wires. And Alcoa Aluminum Rigid Conduit is ideal for separating conductors, regardless of load.

For complete information, write Aluminum Company of America, 2328-L Alcoa Bldg., Pittsburgh 19, Pa.

Your Guide to the Best in Aluminum Value

THE ALCOA HOUR
TELEVISION'S FINEST LIVE DRAMA
ALTERNATE SUNDAY EVENINGS

Can you use 50 Years Experience in Mechanized Handling?



New Mathews Semi-Automatic Pallet Loader developed for the food and beverage industries.

Just over 50 years ago, the first Mathews Conveyers were designed and built—and from that very early equipment has evolved some really spectacular continuous-flow conveying systems—indeed, some of the "show jobs" of the industry.

In these 50 years, Mathews Engineers have developed the most complete line of gravity and power conveyers and special conveying machinery to be found anywhere—to serve nearly every class of industry in the United States and Canada.

Whatever is required—standardized conveyer units or a complete system—you'll find that Mathews has it. Three modern plants. Engineering sales offices and standardized conveyer distributors located in most principal cities.

50 YEARS OF MC MECHANIZED HANDLING

MATHEWS CONVEYER COMPANY

GENERAL OFFICES . . . ELLWOOD CITY, PENNSYLVANIA

PACIFIC COAST DIV. MATHEWS CONVEYER COMPANY WEST COAST, SAN CARLOS, CALIFORNIA

CANADIAN DIVISION . . . MATHEWS CONVEYER COMPANY, LTD. PORT HOPE, ONTARIO

Engineering Offices or Sales Agencies in Principal American and Canadian Cities.
Export Representative—Foreign Trade Division of New York Hanseatic Corp.

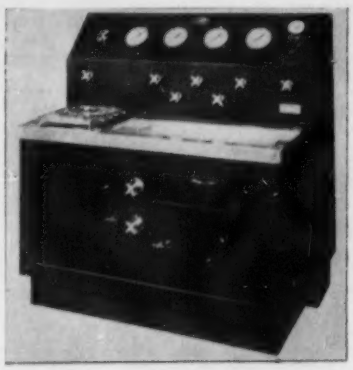
MATHEWS

Equipment & Supplies

by a special direct drive (Fords). This coupling saves power and reduces strain by automatically adjusting to any sagging of the floor or shifting of motor or mill.

A demountable, cage-type fan conveys material as fast as it is ground. It is not necessary to remove the hub to change the fan, only the cage assembly is replaced. Fans can also be supplied as separate units, powered by separate motors for very long conveying distances. — *Myers-Sherman Co., Streator, Ill.*

Circle 133A on Reader Service Card



Packaged Testing Stand Checks Safety Valves

All types of safety valves, from ¼-in. screwed to 4-in. flanged, may be set and checked with this packaged test stand.

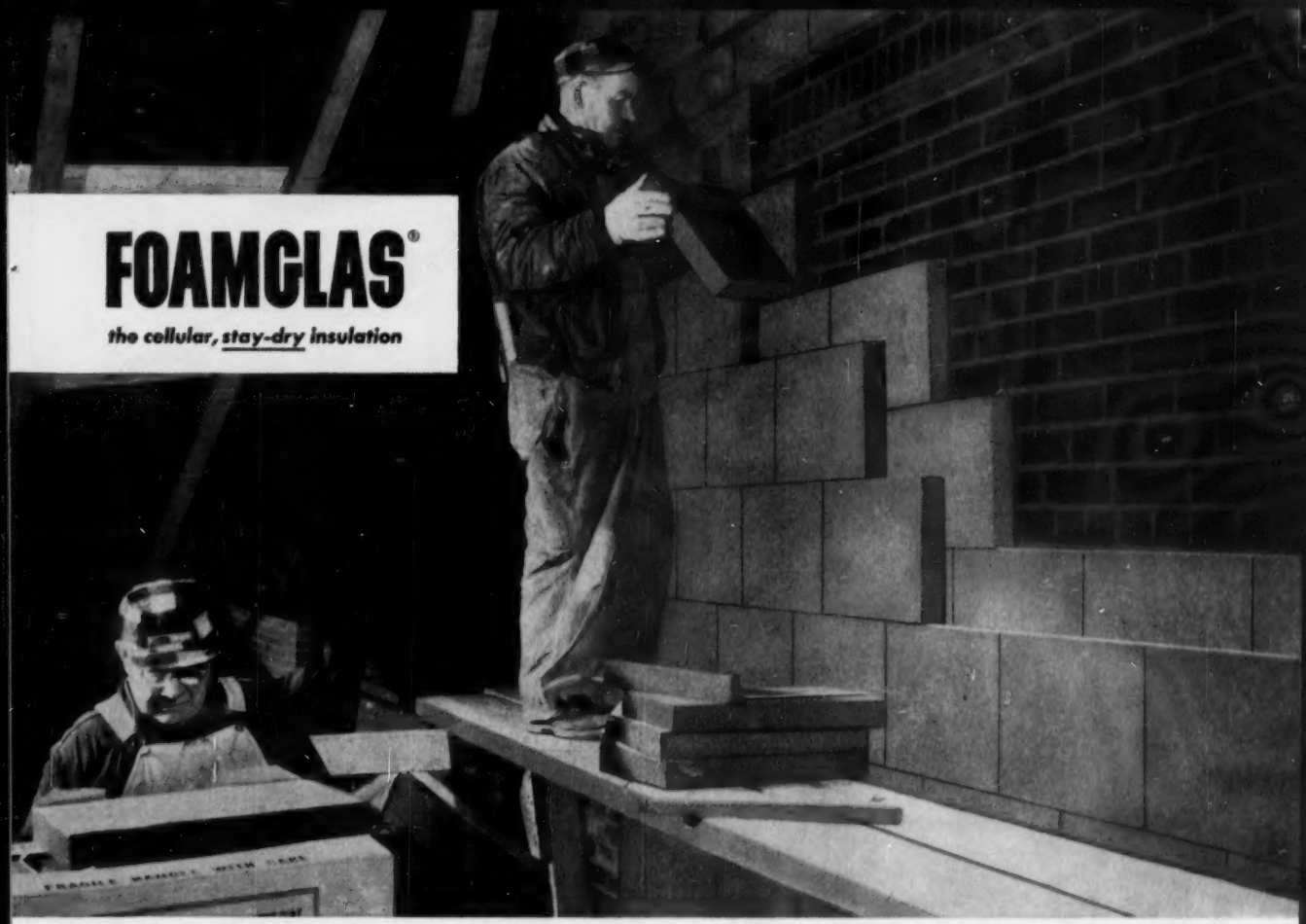
Unit gives accurate readings for pressures between 0 and 1,000 psi. Other models are available for ranges up to 10,000 psi.—*Industrial Engineering Corp., 525 E. Woodbine, Louisville 8, Ky.*

Circle 134A on Reader Service Card

New Condensate Pumps Are Easily Installed

Seen boosting boiler efficiency is a new line of single and duplex condensate return pumping systems, designed for easy installation and low maintenance.

Known as "Hotshot," they are rated up to 10,000 sq. ft. of direct radiation, pressures to 20 psi. High-pressure units (to 50 psi.) are also available. Shallow-type, cast iron receivers in 6 or 20-gal. sizes permit low connection to the return line. No foundation bolts are required and



This multilayer application of 2" FOAMGLAS is at Food Fair's Linden, N. J., abattoir. In this and similar installations throughout their chain, Food Fair relies on moisture-proof FOAMGLAS to help protect food quality . . . by insuring constant, long-lasting insulating value for efficient refrigeration at low cost. Insulation Contractor: Waverly Builders, Inc., Hillside, New Jersey.

In stores and warehouses throughout their growing chain . . .

Food Fair depends on moisture-proof FOAMGLAS to keep insulating value up—refrigerating costs down

In ten short years, Food Fair Stores, Inc., Philadelphia, has grown from 89 stores and sales of $101 million to 237 stores and annual sales of nearly $475 million. Constant, careful attention to food quality has played a big role in that phenomenal growth. And Food Fair's use of *moisture-proof* FOAMGLAS for dependable insulation in refrigerated areas in their stores and warehouses reflects that attention to quality.

Food Fair has found that FOAMGLAS stands for constant insulating efficiency without the costly headache of insulation replacement. Its sealed cellular structure and all-glass composition make it an effective vapor barrier—sealing out the moisture that destroys efficiency of ordinary insulations. And the unique combination of FOAMGLAS strength and rigidity makes it an ideal structural material in many applications . . . even under floors where it can easily withstand loads of over seven tons per square foot.

In various applications throughout their chain, FOAMGLAS insulation for roofs, ceilings, corewalls, wall linings and floors gives Food Fair long-life insulating protection. That insures dependable, low cost refrigeration in such varied locations as an abattoir in Linden, N.J., a warehouse in Baltimore and supermarket cold rooms throughout the Baltimore-Philadelphia area. The excellent performance of FOAMGLAS in all these uses has led Food Fair to plan similar installations for their continuing expansion program.

Prove to yourself that *you*, too, can solve your insulating problems best with FOAMGLAS. Send today for a free sample and directions for six simple "desk top tests" that quickly demonstrate the valuable combination of qualities you get only with FOAMGLAS. Address . . .

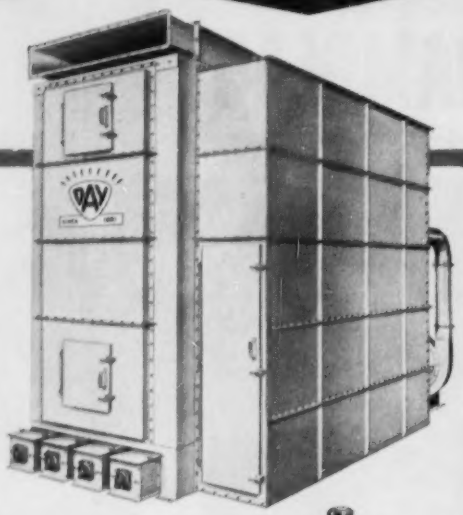
Pittsburgh Corning Corporation
Dept. O-116, One Gateway Center
Pittsburgh 22, Pennsylvania
In Canada: 57 Bloor St. W., Toronto, Ontario

PC ® also manufacturers of PC Glass Blocks

With this test you can quickly prove to yourself the unique compressive strength of FOAMGLAS . . . which allowed Food Fair to use it even beneath load bearing floors. Send today for a FOAMGLAS sample and directions for six simple tests which demonstrate clearly its unique benefits.

DUST CONTROL | **BULK STORAGE** | **PNEUMATIC CONVEYING**

DAY PRODUCTS
SERVE THE FOOD INDUSTRY



. . . CONTROLLING DUST

DAY "AC" Reverse-Jet DUST FILTER ● Dollar for dollar, feature for feature, you get more for your money with a DAY "AC" filter. Economical first cost and low maintenance PLUS the fact sub-assembly by DAY saves up to 75% on installation costs. ● Felted filtering media captures sub-micron dust particles with 99.99+% efficiency. Media porosity is maintained by self-adjusting, high pressure, reverse-jet blow rings. ● DAY filters occupy less floor space—need less headroom—are furnished to operate on suction or pressure. ● May be installed inside or outside; outside units completely weatherproof. **Write for Bulletin 559 for complete facts and engineering data.**

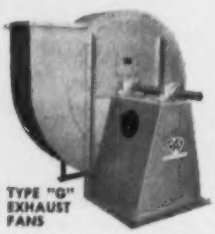
(Licensed by H. J. Hersey, Jr.)

DUAL-CLONE DUST SEPARATOR

Exclusive DAY design provides high efficiency with low horsepower requirements. **Write for Bulletin 490C.**

TYPE "RJ" DUST FILTER

Surge of high velocity reverse air maintains filter media porosity of this "packaged" dust filter. 99.99+% efficiency. **Write for Bulletin 560.**



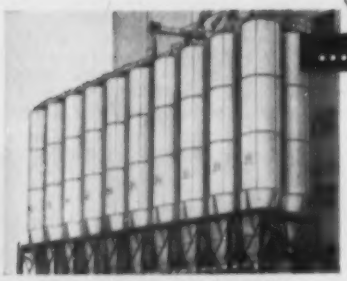
TYPE "G" EXHAUST FANS

High air delivery per horsepower required. Statically and dynamically balanced; designed exclusively for dust control applications. **Write for Bulletin 471.**

DAY UNIT DUST CONTROLLERS

Complete, low cost unit combines high efficiency of DAY Dual-Clone and Exhauster. Ideal for remote locations. **Write for Bulletin 510.**

A SINGLE UNIT OR A COMPLETE DUST CONTROL SYSTEM

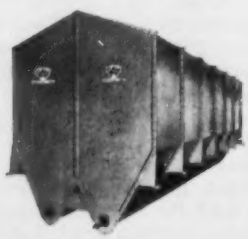


DAY Vertical Type Bulk Storage Bins

. . . HANDLING AND STORING BULK MATERIALS

Vertical or horizontal bins, special sizes or groups furnished to meet production needs; air lock rotary valves, twin screw feeders and other auxiliary equipment optional. DAY bins need no field riveting, soldering or welding. Built and shipped in easily erected bolted sections. **Write for Bulletins 529 and 549.**

AIR LOCK ROTARY VALVE



HORIZONTAL TYPE BULK MATERIAL BIN

INDIVIDUAL BULK EQUIPMENT UNITS OR A COMPLETE BULK MATERIAL SYSTEM

. . . PNEUMATIC CONVEYING

DAY Pneumatic Conveyor equipment and systems provide a modern method of bulk material handling. Self-cleaning to prevent contamination or product deposits in system. Speed of operation improves plant efficiency. **Write for details.**

75 YEARS — DAY — LEADING INDUSTRY SINCE 1881

The DAY *Company*

817 Third Ave., N.E., Minneapolis 13, Minn.
P. O. Box 70D, Ft. William, Ontario

Branch Plants: Buffalo, Ft. Worth, Toronto
Representatives in Principal Cities

units can be set on floor or in a shallow pit.

Centrifugal pumps employed have fully-enclosed bronze impellers, stainless-steel shafts, and compression-type couplings. Pumps will not vapor-lock, and capacitor motors have overload protection with automatic reset.

Automatic controls employ a double-pole switch mounted on the receiver and operated by a float. Duplex units have alternator float switches which operate pumps in sequence or together under peak loads. —*The Deming Co., Salem, Ohio.*

Circle 134B on Reader Service Card

CHEMICALS

Liquid Masonry Coating Curbs Water Damage

Masonry surfaces may be protected from moisture seepage by use of a pigmented liquid coating that can be applied even to damp areas.

Known as Surfa-Sele, it is formulated in a fish-oil vehicle of low surface tension, which is said to impart superior penetrating power. Containing no lead or other harmful element, this coating finds particular application in canneries, dairies, or other food plants where moisture and steam present maintenance problems.

Product can be rolled or brushed on, and dries to a semi-gloss white finish. For indoor use it can be tinted.—*Rust-Oleum Corp., 2799 Oakton St., Evanston, Ill.*

Circle 137A on Reader Service Card

Easily-Applied Mastic Resists Acids, Alkalis

Numerous applications are cited for a new mastic developed to resist acids and alkalis that destroy mortar, concrete, and wood.

Called Floor-Nu, it can be used to resurface wood or concrete floors, to patch damaged areas in refrigerated rooms or truck beds, and to repair interiors of concrete or steel tanks. Product is said to have excellent adhesion, tensile strength, and resistance to abrasion.

It is easily applied in the cold without use of special tools.—*Steelcote Mfg. Co., 3418 Gratiot, St. Louis 3.*

Circle 137B on Reader Service Card

One of the three gas-fired ovens for curing H-I Fishing Rod blanks. Partlow Model RCS Recording Control is visible on outside of oven.

Close-up of Partlow Model RCS Recording Control on H-I curing oven. Each oven is governed by one of these controls.

Partlow Controls help put more fun in fishing with H-I Power Glass Rods

No matter what you make, Partlow Controls will help make it *better!*

Horrocks-Ibbotson Co., Utica, N.Y., manufacturers of the world's largest line of fishing tackle, depends on Partlow Controls for accurate heat in curing woven glass rod blanks. Pin-point heat control is necessary to assure proper resiliency and action in the finished rod.

Blanks undergo a 3-hour curing cycle . . . are brought slowly from room temperature to 320°F, then held there for 1½ hours.

Partlow Controls also are used in several other H-I operations.

BRING YOUR TEMPERATURE CONTROL PROBLEMS TO PARTLOW

There's a Partlow model just right for your job . . . for use with oil, gas, steam or electricity.

Write today for Condensed Catalog Dept. F-1156

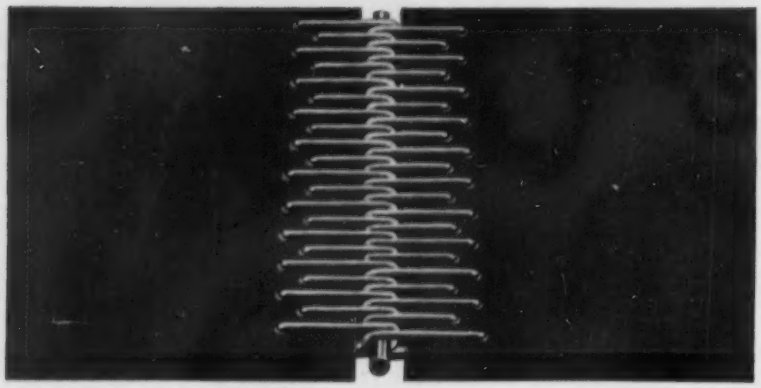
partlow

the pioneer in mercury thermal controls

THE PARTLOW CORPORATION • NEW HARTFORD, N.Y.

Offices in All Principal Cities

the fastest way to make ends meet



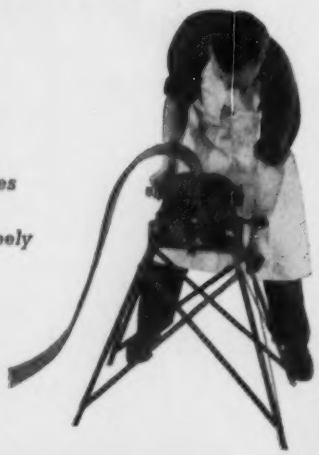
Clipper

HOOKS and LACERS

in materials handling, food harvesting and processing, power transmission, wherever flat ends must be joined.

Clipper belt lacing equipment for belts, aprons, tapes and ribbons!

- *produces secure, flexible joints in minutes*
- *does not injure belting*
- *gives smooth, flexible joint that rides freely over conveyor rollers*
- *is flexible both ways of the belt*



WRITE FOR FREE SAMPLE

Send a sample of your belting, apron or ribbon to Clipper with an outline of your problem. They'll determine the best method of fastening and then lace your sample FREE.

Ask your Industrial Distributor for Clipper Products

Clipper BELT LACER COMPANY

988 Front Ave., N. W., Grand Rapids 2, Michigan

BRIEFS . . .

Dial Thermometer has red and green pointers for showing maximum and minimum readings.—*Palmer Thermometers, Inc., Cincinnati.* (138A)

Pipe Markers identify lines by color and legend to simplify tracing. Self-sticking units are of vinyl cloth with all-temperature adhesive, and are silicone overcoated.—*W. H. Brady Co., 727 W. Glendale Ave., Milwaukee 9.* (138B)

Non-Toxic Grease for food processing is water-white, tasteless, and odorless. Made from refined white mineral oil, it is not affected by water or high temperatures.—*Bel-Ray Co., Madison, N. J.* (138C)

Plastic Tanks of polyester fiberglass are approved for vinegar processing and storage. Available in sizes to 30,000 gal., they resist food-acid corrosion and temperatures to 260F. in continuous use.—*Haveg Industries, Inc., 900 Greenbank Rd., Wilmington 8, Del.* (138D)

Heavy-Duty Hand Trucks employ interchangeable rubber-tired wheels for handling variety of loads—cartons, bags, barrels—*Nutting Truck & Caster Co., Anoka, Minn.* (138E)

Automatic Tape Dispenser is air-operated to deliver strips of pressure-sensitive tape as needed—*Air Fixtures Inc., 202 W. Main St., N. Manchester, Ind.* (138F)

PVC Expansion Joints for temperatures to 140F. stretch 3¾ in. Fittings available in 1, 2, and 3-in. dia.—*Tube Turns Plastics, Inc. 2929 Magazine St., Louisville 11, Ky.* (138G)

Pneumatic Recorder-Controllers (pressures to 25,000 psi, temperatures to 1,200F.) are spring or electrically driven, accurate to 1%—*A. W. Cash Co., P. O. Box 551, Decatur, Ill.* (138H)

Pouring Spout of 10-gage sheet metal fastens on steel or fiber drums, aids pouring of powders and viscous liquids—*Sterling-Fleischman Co., Broomall, Pa.* (138I)

Stainless Extruder Screws of any diameter, pitch, and flight thickness range from 80 grit to mirror finish. —*M-H Standard Corp., 513-521 Communipaw Ave., Jersey City 4, N. J.* (138J)

LQ600 VALVES

• NO LEAKAGE • NO EROSION • NO WIRE DRAWING
. . . In 100,000 applications and 5 years of tests

Famous LQ600 Bronze Valves, with revolutionary Brinalloy seats and discs, now solve maintenance problems in a new wider range of services!

The lower pressure LQ600-150 made valve history during five years of cost-cutting use in a big variety of installations, ranging from "normal" to "exceptionally severe."

Now the higher pressure LQ600-200 offers all the same proved features — plus a stronger body and bonnet of exclusive Lunkenheimer S-1 Bronze. It has a total temperature rating of 550°F.

It will pay you to specify and install LQ600 in your toughest 150 and 200 lb. services. New Brinalloy seats and discs resist wear and corrosion to an amazing degree — far greater than 500 Brinell Stainless Steel . . . even outwear case hardened Stainless Steel exceeding 1000 Brinell. The flat seats and discs are micro-optically lapped to a perfect fit — and brazed in to stay.

Call your Lunkenheimer distributor or write The Lunkenheimer Company, Box 360, Cincinnati 14, Ohio.

BRONZE • IRON • STEEL • PVC

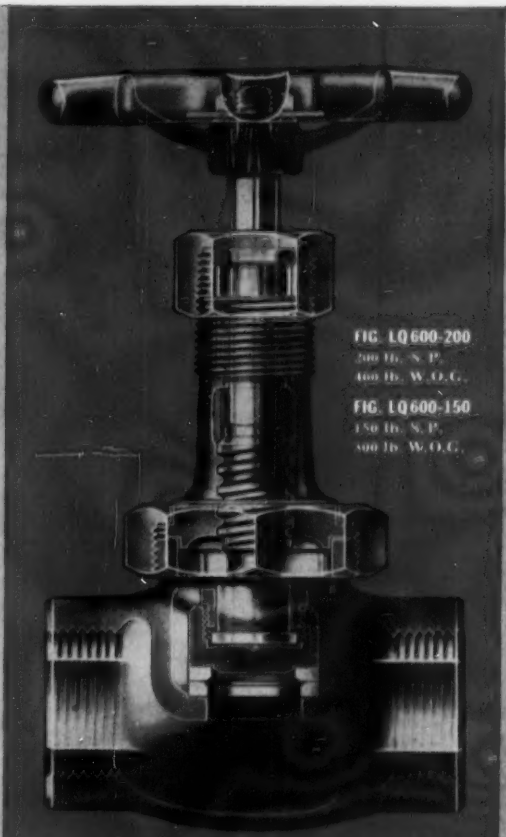
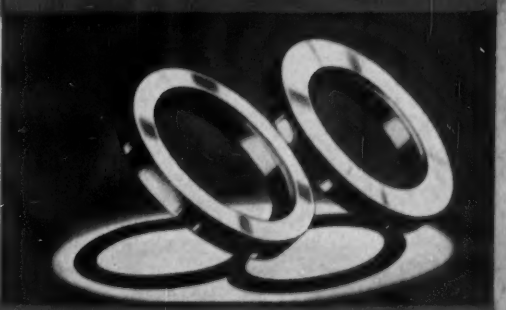


FIG. LQ600-200
200 lb. S.P.
400 lb. W.O.G.
FIG. LQ600-150
150 lb. S.P.
300 lb. W.O.G.

NOW AVAILABLE FOR
200 LB. S.P. 550°F. 400 LB. W.O.G. and
150 LB. S.P. 300 LB. W.O.G.
APPLICATIONS



BRINALLOY* SEATS AND DISCS

*Patented Alloy —TM Reg.

LUNKENHEIMER®
THE ONE *Great* NAME IN VALVES

L-956-31

Titanium Tubing

For processing lines carrying fluids of an extremely corrosive nature — look to *Contour Trentweld* titanium tubing for reliable service.

This titanium tubing is completely uniform throughout any cross-section. The weld zone is free from bulging weld bead because Trent's exclusive process — performed with the weld area at the bottom — forms the molten weld metal into the shape of the tubing.

And, with titanium, you get the unique advantages of a tubing that's strong as steel but 44% lighter . . . virtually immune to a broad spectrum of corrosive materials . . . entirely free from stress-corrosion cracking.

So, next time you need a strong, light, extremely corrosion-resisting tubing — try *Contour Trentweld* titanium tubing. And remember, it's made by Trent — tube mill specialists.

CONTOUR TRENTWELD®

Stainless and High Alloy Welded Tubing

TRENT TUBE COMPANY, GENERAL SALES OFFICES, EAST TROY, WISCONSIN (Subsidiary of Crucible Steel Company of America)

EQUIPMENT APPLICATIONS

Cuts Case-Handling Time With Palletized Loads

Specially designed for palletized loads, this refrigerated milk truck has cut case-handling time and labor at Dean Milk Co., Chicago.

Its raised bumpers afford quick spotting at loading docks. Full-opening rear doors make entire width of the body (Batavia Body Co., Batavia, Ill.) available for efficient loading and unloading by lift truck. The floor, of extruded aluminum bars, is at dock height, which permits safe use of dock boards.

This floor construction also provides a lightweight, rustproof, and non-skid surface. It is pitched for quick drainage and easy hose-cleaning. Hold-over plates are located near the roof to permit stacking of cases 5-high, flush with either wall or front of the truck.

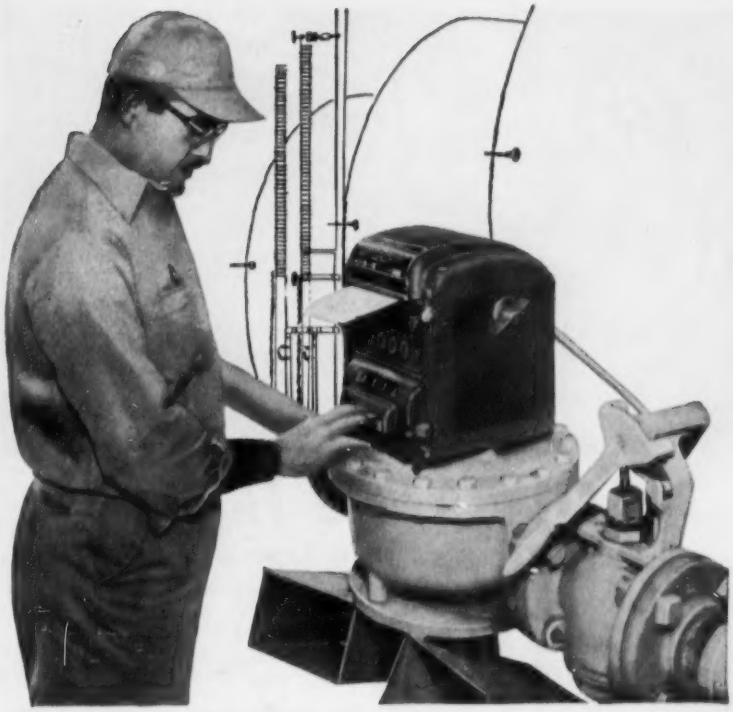
Circle 141A on Reader Service Card

Plastic Conveyor Belting Has Wide Application

Paper-thin conveyor belts of Mylar are finding numerous applications in processing of chocolates, citrus fruit, meats, and fried foods.

The belting (Permagloss, Mohawk Supply Co., Commercial Trust Bldg., Philadelphia 2) offers an unusual combination of properties—strength, smoothness, flexibility, non-absorbency, and resistance to acids, fats, and frying oils.

At Goldenberg Candy Co., Philadelphia, these belts are being used in cooling tunnels to impart a glossy bottom finish to chocolates. The 128-ft. belts are 32 in. wide and pro-



New quality control-
Meter-Printed Batch Tickets with

NEPTUNE *liquid* METERS

Get printed proof of delivery and automatic control of liquids going into the batch . . . with the Neptune Print-O-Meter. Prints exact quantities, with serial numbers and code letters to identify the batch and/or station. Foolproof operation . . . ticket is inserted and locked in place in meter before delivery. Ticket cannot be removed before being printed out.

You get quality control and dispute-free printed records of delivery if you handle any of these liquids (and others too!). Print-O-Meter sizes: 1 to 4 in., capacities 5 to 500 gpm. Other meters 2 to 1000 gpm.

Send for free Technical Metering Bulletin 567-HF

How many of these liquids can you handle better with Neptune?

Acetates	Lime Water
Acetone	Linseed Oil
Alcohol	Liquid Soap
Ammonium Nitrate	Liquid Sugar
Ammonium Sulfate	Lubricating Oil
Banana Oil	Methylated Spirits
Barium Chloride	Methyl Bromide
Benzol	Methyl Formate
Borax Solution	Methyline Chloride
Brine	Mineral Spirits
Bunker "C"	Molasses
Butanol	Naphtha
Calcium Chloride	Oleic Acid
Carbon Bisulphide	Oleum Spirits
Carbon Tetrachloride	Paint
Castor Oil	Paraffin Oil
Cellulose Solvent	Paste
China Wood Oil	Perfume
Chloropicrin	Pine Oil
Chocolate	Plasticizer
Cocoa Butter	Polymer, Molten
Coconut Oil	Propylene Glycol
Coffee	Pyrethrum Mixtures
Condensate	Rum
Corn Syrup	Shellac (Alcohol)
Cotton Seed Oil	Silicone Oil
DDT	Soap Solution
Dextrine Solution	Sodium Benzoate
Diacetone	Sodium Carbonate
Dibutyl Phthalate	Sodium Chloride
Diethyl Carbitol	Sodium Silicate
Diethylene Glycol	Soy Bean Oil
Dimethyl Phthalate	Starch Solution
Ethyl Cellosolve	Stearic Acid
Ethylene Glycol	Styrene Monomer
Fish Oil	Sugar Syrups
Formaldehyde	Tallow
Freon	Tannic Acid
Fuel Oil, Hot	Trichlorethylene
Glucose	Tungwood Oil
Glue, Water Sol.	Turpentine
Glycerine	Varnish
Grease	Vinyl Lacquer
Ink	Water
Isobutylene	Wax Emulsions
Isopropanol	Whiskey
Kerosene	Wine
Lacquer	Xylol

HFF

NEPTUNE METER COMPANY

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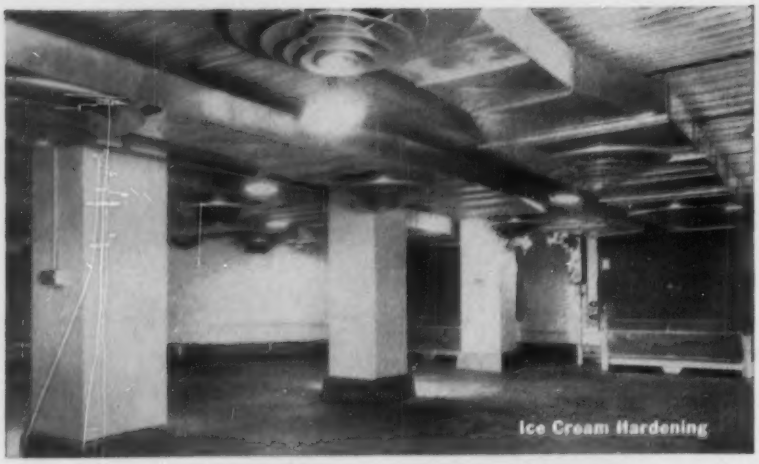

Ice Cream Hardening

NIAGARA "NO FROST"

25 Years' Successful Experience

Fresh Meat Chilling

Get faster temperature "pull-down"

Always clean freezing or storage rooms

Protect frozen food quality

Save Power...Reduce Costs

Citrus Concentrate Freezing and Storage

Write for Niagara Bulletin 105

NIAGARA BLOWER COMPANY

Dept. F.I., 405 Lexington Ave. New York 17, N. Y.

District Engineers in Principal Cities of U. S. and Canada

Equipment Applications

vide fast cooling in the 40-F tunnels. Furthermore, they maintain their surface smoothness, which is particularly important with cream-filled items since it prevents formation of small holes in the bottoms and resulting leakage of cream.

Belting is made by laminating two 3-mil sheets of polyester film, with a few inches left open at both ends. Processors instal the belt by fitting it to the conveyor and sealing the two dovetailed ends. A special adhesive and brush are supplied. Pressure-sensitive tape with a Mylar backing completes the smooth finish, which is not affected by scraping or cleaning.

Circle 141B on Reader Service Card

Separator's Liquid Seal Ups Dairy Throughput

Top-efficient separation of milk and whey is reported by Renwick Creamery, Renwick, Iowa, through use of a novel dairy separator with "liquid-seal" design. Eliminating the need for mechanical seals, unit (Westfalia MN-C, Centrico Inc., Englewood, N. J.) also minimizes maintenance costs and downtime.

In operation, preheated milk enters the separator bowl which rotates about a centripetal pump built into the top of the machine. Pump's disk periphery is submerged in the milk, thus creating a sanitary and air-tight liquid seal. Products are discharged foamlessly under pressure, without use of accessory pumps.

Some 8,000 lb. of separated milk and 20,000-30,000 lb. of whey are produced daily. Latter is discharged to a holding tank in another building by pressure developed in the separator.

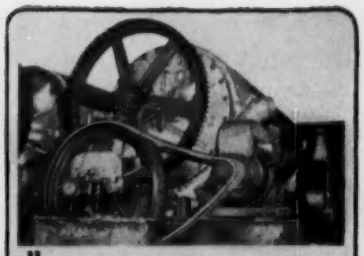
Circle142A on Reader Service Card

Radiant Heating System Keeps Floors Dry

Radiant heat maintains a dry floor in Jefferson Island Salt Co.'s warehouse despite precipitation of moisture from the saturated atmosphere.

The system (A. M. Byers Co., Clark Bldg., Pittsburgh 22) consists of 1¼-in. wrought-iron pipe coils laid on 18-in. centers and covered by 3 in. of concrete. Water at 140-180F. is circulated through the coils to evaporate moisture.

Circle 142B on Reader Service Card



"THIS LUBRICANT INCREASED CHAIN LIFE 4 TIMES"

—says FASTERFAT, Division of National Sea Products Limited

"Two years ago we switched from the lubricant we were then using to your LUBRIPLATE, and we are pleased to inform you that we have had very excellent satisfaction from its use. High speed silent chains on the drives of our fish meal cookers, which were formerly worn out in about six months, are still in service after two years."

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE

LUBRIPLATE LUBRICATION

MAKES CARS AND TRUCKS RUN BETTER AND LAST LONGER

LUBRIPLATE H.D.S. MOTOR OIL . . . THE OIL THAT NEEDS NO ADDITIVES

For nearest LUBRIPLATE distributor see Classified Telephone Directory. Send for free "LUBRIPLATE DATA BOOK" . . . a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.

Freeze-Drying Units

—*Continued from page 41*

During dehydration, pressure in the cabinet is reduced to 0.21 psia. A steam-operated ejector above the unit delivers air and evaporated moisture to a jet condenser at the rear of the cabinet. Here, condensate and cooling water are removed by a centrifugal pump, while noncondensables are eliminated by water ejection.

A 3-hp. motor drives the pump that circulates hot water (284F. maximum) through the plates under pressure. Same pump handles cooling water at the end of the drying cycle. Water is heated or cooled in a heat exchanger.

Maximum steam consumption is 1,000 lb. per. hr. at 120 psi. Cooling water is used at 4,700 gph. Motor ratings: For hot-water circulating pump, 2.7 kva.; condensate pump, 4.3 kva.; ejector pump, 8.5 kva.; and hydraulic pump, 1.7 kva. *End* (*Resume reading on page 42*)

Pressure Gun Cleaning

—*Continued from page 52*

Accordingly, our chief engineer, D. H. Kimball, devised an automatic, detergent feeding system that eliminated the 55-gal. drum.

It consists of a 500-gal. stock detergent-solution tank, a 500-gal. mixing tank, a centrifugal pump, a high pressure reciprocating pump, and pipe lines that lead to convenient plant outlets (see diagram).

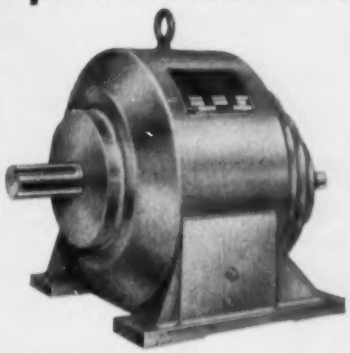
The stock tank is filled (one or more days before the cleanup) with a concentrated solution prepared by mixing 1 lb. of detergent per gallon of water. This mixture is then diluted 16 to 1 with water as it is pumped by centrifugal pump from the stock tank to the mixing kettle.

The dilute solution is kept at constant level in the latter tank by an electrode limit switch. Temperature is maintained at about 125F. with steam injection and a direct-acting temperature control valve. The high pressure reciprocating pump (200 to 300 psi.) supplies detergent to the guns at the rate of 20 gpm.

In operation, cleanup men couple the high-pressure hoses and guns to the nearest outlet, generally using two guns for each bank of extractors.

The system has likewise been very successful for cleaning evaporators, juice tanks, and any other machine containing spots that can't be reached with other cleaning methods. *End* (*Resume reading on page 52*)

New IN-LINE Speed Reducers...

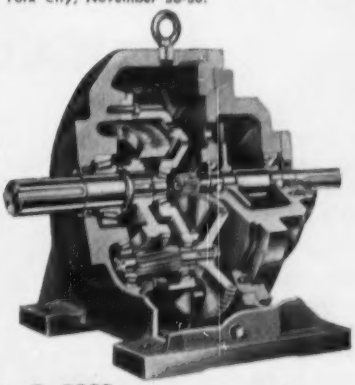


FLEXIBLE... ECONOMICAL... EFFICIENT

The streamlined compactness of these new units makes them ideal for mounting in places where space is limited. Accurately manufactured helical gearing, rugged housing construction and precision mounted shafts and bearings assure long, dependable service, with a minimum of maintenance. The *new* Phillie Gear "IN-LINE" Reducers are available in 18 different sizes and gear reductions to suit most types of service. Available for mounting in various positions . . . Standard AGMA ratios from 1.25:1 to 205:1.

Send for illustrated Literature describing these money-saving Speed Reducers.

See the newest developments in Mechanical Power Transmission at our Booth #80—22nd National Power Show, New Coliseum, New York City, November 26-30.



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Offices in all Principal Cities

INDUSTRIAL GEARS & SPEED REDUCERS
LIMITORQUE VALVE CONTROLS
FLUID MIXERS • FLEXIBLE COUPLINGS

Virginia Gear & Machine Corp. • Lynchburg, Va.

A HEALTH *plus* ON YOUR LABEL

● Every meal she sets on her table must meet two basic requirements . . . it's like second nature to her: a meal must be *appetizing* and *health-providing*. With these goals in her subconscious, what happens in the store?

The grocery store is the proving ground of competition. *Hundreds of powerfully advertised brand names compete for her favor,* for her judgment of what will provide appetizing, health-providing meals. That's when your food product needs *a plus on the label,* a signal to her health-consciousness!

"Vitamin Enriched," "Vitamin Fortified." Those signals, those words can make a big difference today in moving *your product* to her table. Why not let a Pfizer representative tell you *in his words* the full details on how Pfizer vitamins can significantly increase your product's sales potential. Pfizer has been a major vitamin research and production center since the first vitamin was commercially produced.

Here are just 3 examples of food products that are increasing sales with Pfizer vitamins:

A health plus on the label of carbonated beverages says "Vitamin Fortified" *(and means sales).* With Pfizer Vitamin C and Vitamins of the B Complex fortification costs just a fraction of a cent per bottle.

Pfizer experience can help you put the health

MOVES PRODUCTS TO HER TABLE

A health plus on the label of flour, macaroni and similar products says "ENRICHED" *(and means sales).* New light-color Pfizer BI-CAP is now simplifying the problem of enriching white flour for many millers.

A health plus on the label of canned juices and concentrates says "Vitamin Fortified" *(and means sales).* Fortification here will offset processing losses and seasonal variations in natural vitamins.

* * *

What's the most powerful *plus* you can offer the food shopper? It's those extra health words on your label. Let Pfizer help you put them there.

Quality Ingredients for the food industry for over a century

Pfizer

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630 Flushing Ave., Brooklyn 6, N. Y.
Branch Offices: Chicago, Ill.;
San Francisco, Calif.; Vernon, Calif.;
Atlanta, Ga.; Dallas, Texas

plus on your label simply and economically

NEW PACKAGES & PRODUCTS

Zip-Open Foil Carton

An aluminum refrigerated or frozen food container with a zip-open lid has been developed by Reynolds Metals Co., Louisville, Ky. The casserole type package is opened with a tear strip.

Lid is tightly crimped and sealed by a new method with specially designed closing equipment, made available by Reynolds in various models, ranging from manual to high-speed automatic equipment. Lids are color printed.

Container is a popular 12 fluid ounce size measuring 4½ x 5½ in. A 14-oz. size will soon be available. Firm can produce any size desired, the same lid fitting all sizes, eliminating the need for mechanical changes on the closing equipment.

Tear strip consists of a strip of cut plastic material (Mylar) laminated to an easily removed strip of aluminum. Strips move down the middle, making it easy to remove remaining portion by lifting. Strip corrugates the edges, assuring safe removal of the remainder of the lid for serving.

By partially removing the strip, foods may be cooked or heated in the container itself.

Circle 146A on Reader Service Card

New Corn Bread Mix

In line with the "convenience for the consumer" trend is the new Aunt Jemima corn bread mix. The product is packed in a zip-tape carton with its flexible mixing bag, and baking pan.

Milk and eggs are added to the mix in preparation. It is baked for 20 min. to produce six portions.

Tetra Pak Makes Dairy Debut

Sunrise Dairies, Hillside, N. J., is reported to be the first United States processor to use a compact Swedish machine that simultaneously forms and folds milk cartons from a single roll of paper. Called Tetra Pak, process is being used to package milk in ¾ oz., 4 oz. and 8 oz. cartons. Machines are capable of turning out 75 to 90 filled cartons per minute and are reported to take up a fraction of floor space required for conventional machines.

In the process a roll of printed heavy white paper lined with polyethylene unwinds from a reel into the machine as a vertical tube, is heat-sealed by a pinch at the base, filled with liquid, then sealed by another pinch at right angles to the first below the level of the liquid.

Last pinch heat seals the polyethylene lining and secures the package. Cutters automatically provide a chain of pyramid-like Tetra Paks into individual units.

Paper used in the process is being made by Crown Zellerbach Corp., who signed a contract in June with the inventors, A. B. Tetra Pak, Lund, Sweden.

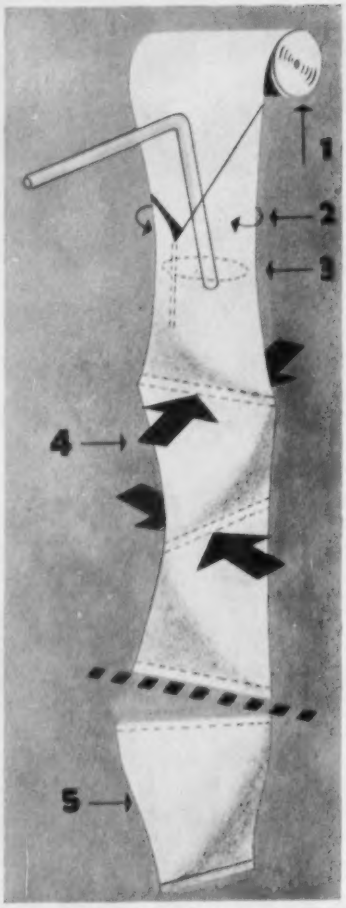
More Machines Ordered

According to the Swedish firm, ten commercial Tetra Pak machines are on order here. Processors planning to use the machines include dairies, ice cream plants, and citrus juice packers.

An advantage in the package is seen in the absence of air in the filled container. This means that dairy products will keep longer and retain flavor better. Polyethylene lining makes the carton virtually leakproof.

The New Jersey dairy is now producing half pints of milk in Tetra Paks for schools. The unusual shape has prompted Sunrise to name the carton "Tee-Pee." Cream, packaged in ¾ oz. cartons, is being distributed to restaurants in the Hillside area. Sunrise plans to package heavy cream in a ½-pt. size, as well as ½ pt. of half and half.

The Tetra Pak machines may be used to package ice cream. Since the lining of the carton is polyethylene, ice cream slides easily from the open carton with a little hand pressure. Or it may be eaten directly from the Tetra Pak.



FIVE STEPS in Tetra Pak processing are: 1) Paper is fed from roll; 2) Tube is formed by heat-sealing seam; 3) Tube is filled with product; 4) Heat-sealing jaws form tetradedrons; 5) Continuous ribbon is clipped into individuals Tetra Paks.

Circle 146B on Reader Service Card

Two New Fruit Products

Two new fruit products have been introduced by C. H. Musselman Co., Biglerville, Pa.

Spiced apples, peeled, cored and

"Buy the bag . . .
save the difference", says Duncan

NEW DUNCAN COFFEE PACKAGE IS FORMED, FILLED AND SEALED ON A SHELL-PAKIT MACHINE AND USES RIEGEL LAMINATED, OPAQUE DIAFANE® SUPPLIED IN ROLLS.

Protecting the sales-winning qualities of fine products is only one of the many functions of Riegel papers. Saving money is important, too. Riegel does it for you by creating the right combination of the most efficient packaging materials . . . and by "tailor-making" the paper to run and seal at high speeds on your machines. Tell us what you want paper to do for you. Riegel Paper Corporation, P.O. Box 170, Grand Central Sta., New York 17, N. Y.

Riegel PROTECTIVE PAPERS FOR PACKAGING

GLASSINES AND GREASEPROOFS
Plain • Waxed • Printed
Lacquer-Coated • Laminated

For more data, circle this page number on card at back →

FILTRATION NEWS

CROSS-SECTION through new white MICRO-KLEAN element. Graded density provides filtration in depth, gives longer life, more complete solid removal.

NEW
5-micron filter

Provides 50% longer service life, polishes, purifies liquids to sparkling clarity, handles highly alkaline fluids

Cuno's new white MICRO-KLEAN filter cartridge (No. 2278-B2) brings a new degree of clarity and purity to beverages and other fluids demanding the utmost in filtration.

It's guaranteed to remove 98% to 100% of particles larger than 5 microns on the first pass of fluid plus a large percentage of particles down to 1 micron in size.

And, the new cartridge, retaining the true graded density features of Cuno's MICRO-KLEAN cartridge, lasts up to 50% longer than previous cartridges on recommended applications.

White MICRO-KLEAN is made of cellulose fibres, firmly bonded together with a totally inert resin. There's no possibility of contaminating fluid with harmful or bad tasting substances. What's more, the rigid structure formed by the bonding material prevents rupturing, channeling or distortion of the filter element.

Write today for the complete story on this latest advance in fluid purification. The Cuno Engineering Corporation, 24-11 South Vine Street, Meriden, Connecticut. 6.5

CUNO ENGINEERED FILTRATION

AUTO-KLEAN (edge-type) • MICRO-KLEAN (fibre cartridge)
FLO-KLEAN (wire-wound) • PORO-KLEAN (porous stainless steel)

halved are packaged in a 1-lb. jar with a vacuum cap. Spicy flavor is achieved through impregnation of delicately blended spiced and sugar syrup. Certified food color supplies a red color tone. Product may be used as a dessert, as a salad, or as a garnish.

Apple-raspberry sauce is a blend of distinctive but subdued red raspberry flavor and apple sauce. Seeds are removed from raspberries. Sauce is packaged in No. 303 and No. 10 cans.

Protective Paper Pouch

A weather-resistant paper for packaging instant dry milk solids has been made by coating paper with polyethylene. Made by Bakelite Co., the plastic coating resists the action of most chemicals including oils, greases and acids and is flexible even at temperatures below freezing.

The coated paper is fabricated into a pouch which is easily heat-sealed because of the polyethylene coating. Seal pouch acts as a durable and protective liner inside the cardboard carton.

The plastic coated paper is being used by Challenge Cream & Butter Association, Los Angeles, Calif., to package a 3-lb carton of instant nonfat dry milk solids.

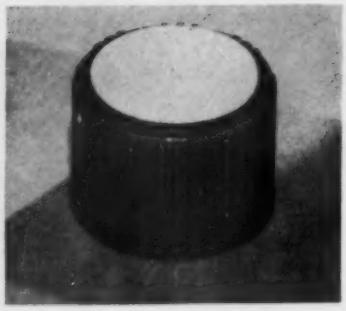
Circle 148A on Reader Service Card

Barbecue Fixings

Beavers Packing Co.'s new multipack offers the consumer the fixings for a complete barbecue meal. The Cluster-Pak sleeve (Atlanta Paper Co.) holds a can of pit cooked barbecue pork and a can of Brunswick stew with chicken.

The two 10 oz. cartons are heated to provide a barbecue meal for two or three people.

Circle 148B on Reader Service Card



Price Spot on Molded Cap

A molded plastic closure with a large white spot mark is being used by R. T. French Co., Rochester, for their Worcestershire sauce package. Believed to be the first time that it has been possible to provide a price spot on a dark-colored molded closure, cap was developed by Owens-Illinois Glass Co.

Packaging development speeds up shelf stocking of the item in food outlets. Non-drip bottle is equipped with plastic slotted fitment for dispersing of sauce by dropful or a stream.

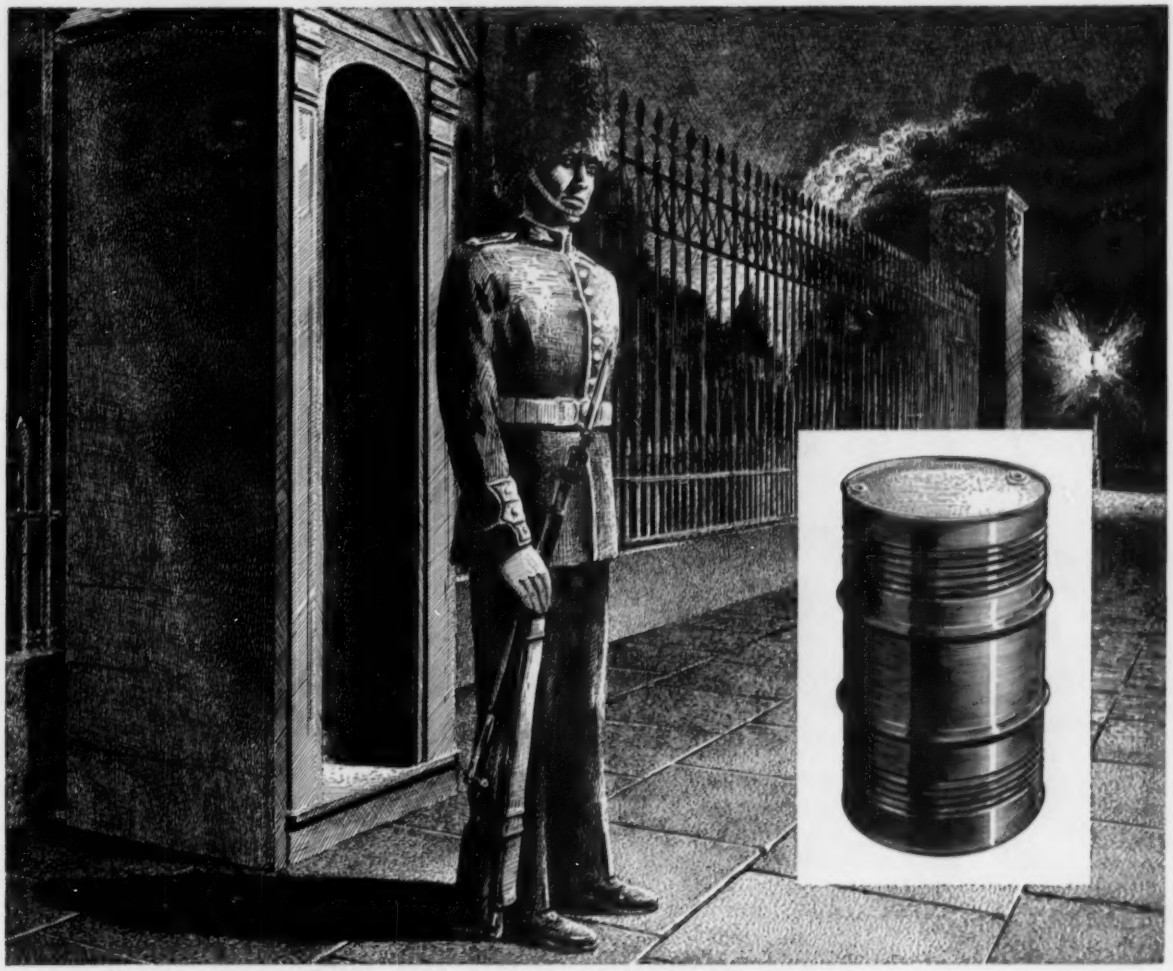
Circle 148C on Reader Service Card

2 Feet of Popcorn

A colorful printed polyethylene bag 24 in. long is the sales boosting package being used for Farmer Boy popcorn. Designed to replace cellophane bags, the package may be used with a popcorn machine.

The red, white and blue bag is manufactured by Milprint, Inc.

Circle 148D on Reader Service Card



USS Steel Drums guard product purity

Care—a special kind of care—goes into the fabrication and finishing of every single USS Steel Drum. From selecting the right kind of rugged steel from our own mills, through the many processing steps of drum-making, until, finally, the component parts – spotless and gleaming – are ready for assembly . . . *care is the byword!*

A final step to insure product protection is the application of a special phosphate solution to the spotlessly clean and scale-free surfaces. The phosphate coating not only guards against contamination and rust, but provides ideal bond for external paint surfaces. This combination of careful workmanship plus quality materials means that your product's purity is completely protected—from the moment it enters a USS Steel Drum—until the drum is tapped in your customer's plant.

Make sure your products have the protection they need—always ship in USS Steel Drums. They are available in capacities from 2½ to 110 gallons. There are special fittings and openings for unusual needs.

UNITED STATES STEEL PRODUCTS

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USS STEEL DRUMS

"It's Better to Ship in Steel"

USS

UNITED STATES STEEL

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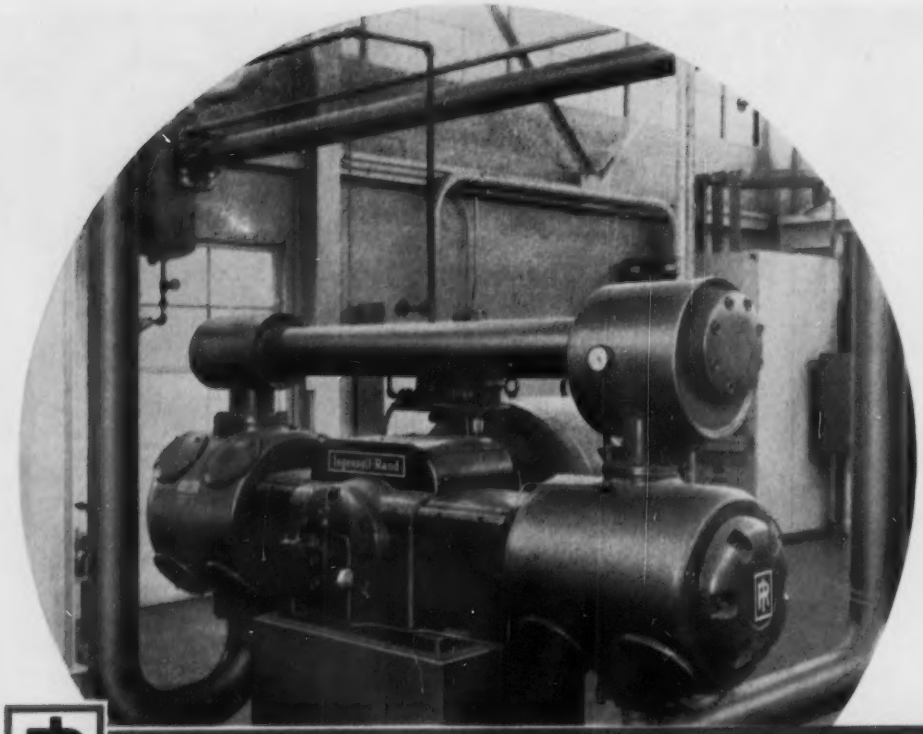

"PHE" COMPRESSOR

serves growing plant-air load at Rotary Electric Steel Co.

WHEN the Rotary Electric Steel Company of Detroit, Mich., increased plant capacity, the existing plant-air supply was also increased by adding the Ingersoll-Rand 100-hp PHE compressor shown above. The extreme simplicity of this installation is obvious at a glance.

The main air supply consists of two Ingersoll-Rand duplex, electric-driven compressors totaling 500 hp. After serving for 40 years they are still giving entirely satisfactory performance.

The new PHE unit is a compact, packaged-type, two-stage air compressor with built-in motor and efficient intercooler. It was shipped completely assembled, ready to run. Installation was simply a matter of mounting the unit on a small foundation and connecting the air, water and power lines. And like many other modern Ingersoll-Rand compressors the PHE has full-floating aluminum bearings that need no adjustments.

Ask your I-R representative for full details on the smooth-running PHE compressor. Its inherent longevity and low maintenance requirements mean big savings in air power costs.

Only I-R Compressors have CHANNEL VALVES

Known the world over for High Efficiency • Quiet Operation
Durability • Air-Cushioned Action • Corrosion-Resistance
Freedom from Warping • Long, Trouble-Free Service

Ingersoll-Rand

1-430

11 Broadway, New York 4, N. Y.

COMPRESSORS • ROCK DRILLS • AIR & ELECTRIC TOOLS
GAS & DIESEL ENGINES • TURBO-BLOWERS • PUMPS

Canned Chocolate Drink

Cans are the package for Nehi Corp.'s new chocolate flavored drinks. The non-carbonated beverage is ready to drink and contains non-fat dry milk, sugar, cocoa, malt, and vanillin. It may be served hot or cold.

Each can contains 9 oz. Cans are manufactured by American Can Co.

Circle 151A on Reader Service Card

Two Twin Cookie Packs

By pairing two standard cartons in one outer wrap, Nabisco and Southern Biscuit Co. have introduced new large size packages without changing their production line or packaging machinery. Nabisco's Lorna Doone shortbread and fig newton are two of the first products using this new packaging idea. The twin packages consist of two overwrapped standard cartons.

Southern Biscuit Co. is using aluminum foil for an overwrap. Color of the foil is keyed to cookie flavor, for example, lemon thins are packaged in yellow colored foil.

Called Twyn-Pak, the new package measures approximately 11¼ x 4½ x 2 in. Foil is provided by Alcoa. Printing by Milprint.

The new double packs provide a larger, attractive package. The same idea may be applied to similar boxed products like spaghetti, cake soaps, candy bars, crackers, etc.

Circle 151B on Reader Service Card

removes risk of contamination in food processing and canning

Juices, acids, alkalies, fats, oils . . . *all liquids* remain on the surface of solid woven Globe Kanry-Tex Belting. Neoprene latex impregnation of all fibres and voids *locks them out!*

Odors and flavors are not picked up nor imparted. Neoprene latex impregnation stands guard against them!

There you have two BIG reasons why fruits and vegetables conveyed with non-absorbent Kanry-Tex are not contaminated en route . . . why sorting and inspection are accomplished without adding "foreign" taste.

But there are other reasons — all just as important to food processing, canning and dehydrating plants — why Neoprene latex-impregnated Kanry-Tex is the most satisfactory of all belting. It may be washed and sterilized with hot water or live steam. Age won't deteriorate it — fibres are rot-free. There are no plies to separate. It's a solid woven carcass. It's tough, lasts longer, thereby reduces belting costs and downtime for change-over. Extremely flexible, it can be run over small pulleys. It permits slitting and trimming to narrower widths with clean-cut, unfrayed edges.

Write Dept. E for free, samples, literature and the name of your local distributor.

GLOBE

GLOBE WOVEN BELTING CO., INC.
1400 CLINTON STREET • BUFFALO 6, NEW YORK

KNOWN FOR QUALITY THE WORLD OVER

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MORE AND MORE OF THE NATION'S LEADING FOOD PROCESSORS ARE BRINGING THEIR PROCESSING, EQUIPMENT AND PRODUCTION LINE PROBLEMS TO

Robins

Our 100 years of background knowledge and engineering experience in helping perfect processing methods, designing special equipment or furnishing "standard" equipment, recommending plant set-up . . . assures the kind of assistance that is available to processors faced with product quality and production cost problems.

CONSULT ROBINS FIRST

A.K.Robins AND CO., INC.

713-729 East Lombard St. • Baltimore 2, Md.

Manufacturers of Food Processing Machinery since 1855

Wherever you look...You'll see ROBINS!

Coffee (or Soup) Break Time

Three machine-dispensed self-service beverage packs have been introduced by the Nestle Co., Inc. Consisting of Nescafe instant coffee, chicken and beef bouillon and Ever Ready sweet milk cocoa, packs were developed in cooperation with Lehigh, Inc., Easton, Pa., dispenser manufacturer.

The Nescafe comes in a 3-in-1 envelope of aluminum foil with separate sections for the instant coffee, sugar and Nescreme, the dairy product for use in coffee. The envelope is folded in half and placed in a cardboard sleeve.

The bouillon consists of an envelope of powder and two cellophane wrapped crackers packaged in a cardboard tray overwrapped with cellophane. The overwrap is complete with a tear strip for easy opening.

The cocoa pack is similar to the coffee container.

The self-service beverage packs are designed for dispensing in offices, airlines, gas stations, colleges, etc.

Circle 152A on Reader Service Card

Bright Carrier for Sauces

A printed corrugated carrier is being used by Scott's Foods, Inc., Los Angeles to package and display three bottles of their varied meat sausage in an attractive Bar-B-Q kit. The wrap-around carrier is manufactured by Robert Gair Co., Inc.

It gives the bottles maximum support, protection and visibility. The wrap-around design makes it easy to load and is stapled at the top to form a convenient sturdy handle. Bottom panel is die cut in strips that fold upward, holding bottles in at each end and protecting them from jarring each other.

Carrier is printed in a wood-grain liner to attract attention and suggest product's out-of-door flavor.

Circle 152B on Reader Service Card

Frozen Vegetables in Foil

Frozen vegetables are being packaged for the first time in foil by the Susquehanna Frozen Food Center. Called Bencoseal, overwrap is pro-

keeps the "FRESH" in refreshments

Keeping cakes, cookies, icings and candies fresh is a matter of keeping them moist. That's exactly what Nulomoline does. Nulomoline, a product of the American Molasses Company, is a pure sugar processed to actually absorb moisture from the air. Used as an ingredient in many types of foods, it prolongs freshness—keeps the foods from drying out.

To protect Nulomoline's inherent purity during transit and storage, American Molasses Company specifies Inland "protection-eered" containers. These Inland steel pails with custom-made linings guard against the possibility of contamination and discoloration. The American Molasses Company also depends on Inland's complete lithographing services to give their Nulomoline pails a trim, attractive exterior . . . one that will register strong brand identification.

**the right container, with the right lining for your product.*

NOW . . . ABOUT YOUR PRODUCT. Could the right container lining solve your problem of maintaining quality-in-transit? Would a more attractive container help your sales? Write Bob Boecher, Dept. 324B and find out how steel packaging by Inland can help you.

INLAND STEEL CONTAINER COMPANY

Division of Inland Steel Company • 6532 South Menard Avenue, Chicago 38, Illinois • Plants: Chicago, Jersey City, New Orleans, Cleveland and Greenville, Ohio.

Full line of stainless steel shipping containers, galvanized and heavy duty ICC drums.

For more data, circle this page number on card at back →

Gorton's®

protects end-product uniformity...

...with automatic viscosity control

In this compact WILEVCO System engineered by W. L. Cummings and Co., a Foxboro Dynalog Controller (center) maintains desired batter consistency and provides a continuous record of viscosity. Viscosity-sensing element is the Brookfield Viscometran (right).

To meet the high quality control standards at Gorton's of Gloucester all fish sticks must be extremely uniform in size, weight, and appearance when packaged. Hence the batter in which they are dipped, prior to breading and frying, must be of uniform consistency. This famous fish processor relies on a Foxboro Dynalog Controller working with a Brookfield Viscometran, to keep batter consistency uniform *automatically*.

In this compact control system, viscosity of the batter is sensed by the Viscometran and continuously recorded by the Dynalog Instrument. Also, sump level is sensed by an electrical probe. Both the batter viscosity and sump level are automatically maintained by interlocked electrical control which adds either water or dry mix (or both) to hold level and consistency within the desired limits.

This installation is typical of hundreds throughout the food industry in which Foxboro Instrumentation is assuring processors highest efficiency, quality, and economy. For details on control of *your* process, consult your Foxboro Field Engineer, or write **The Foxboro Company, 3011 Neponset Ave., Foxboro, Mass., U.S.A.**

FACTORIES IN THE UNITED STATES, CANADA, AND ENGLAND

FOXBORO
REG. U. S. PAT. OFF.

INSTRUMENTS THAT IMPROVE PRODUCT QUALITY

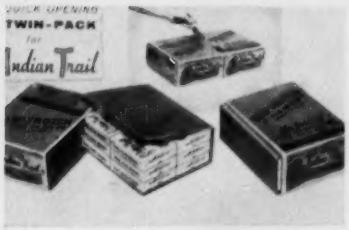
duced by Shellmar-Betner Div. of Continental Can Co.

Applied over a plain carton, wrap is a foil-wax tissue lamination that is heat-sealing, moisture-proof, vapor-proof and airtight.

Another "first" for the package is its institutional size sold directly to consumers through Susquehanna Outlet Stores. Housewives use whatever quantity they desire from the big package (40 oz.) and retain the balance.

Vegetables are all individually quick frozen. That means that each single pea, bean, etc. is frozen separately before being packed, rather than in a solid block.

Circle 152C on Reader Service Card



Break-Apart Carton

Latest thing in quick-handling of boxed cartons is the Indian Trail Cranberry-Orange Relish shipping case. Containing 24 10½ oz. packages of the frozen product, it breaks in two separate containers holding 12 each, at the pulling of a tab.

When space is at a premium, one dozen can be stored in the cold box while the rest is placed in the refrigerator.

New Product Shorts

Grape Juice concentrate has been added to the Bird's-eye frozen juice line, bringing total varieties to seven.

Baked Corn Chip called Korn-Nik has been developed by Maize Industries, Earlville, Ill. The chips are greaseless and low in calories.

Shake and Pour plastic top for International Salt Co.'s new 1-lb. container of Sterling salt has been introduced.

Gold Foil with a printed design is being used by Food Fair Stores, Inc. to package its Lady Fair tea bags. Foil is laminated to boxboard by special process developed by Gair Cartons Div.

Test-Marketed by Quaker Oats Co. of Chicago are four new products: oatmeal cookie mix, hot breakfast pack, sugar puffs, and rice flakes.

FOR FLAVOR *Retention*
Unmatched Quality
Consistent Uniformity

AMERIO
DOUBLE CONTACT
PRESSURE PLATE FREEZERS
(U. S. Pat. No. 2,608,069 Canadian Pat. No. 494,746)

Do the Best Quick Freezing Job

AMERIO INSTALLATION — PATTERSON FROZEN FOODS

Processors find the outstanding performance of *Amerio Freezers* leads to larger and more profitable business. The contact plates provide double freezing—from the top and from the bottom of your product—at the same time. The fast, uniform freezing provides full quality and flavor retention.

The hydraulically controlled pressure plates give flat, uniform packages every time, with maximum eye and sales appeal. Amerios are most economical to operate, automatic in action and completely portable.

Designed for Ammonia, Brine or Freon Refrigerants.

Amerio
Contact Plate Freezers Inc.
Union City, N. J.
"It's the Contacts that Count"

Send For Illustrated Brochure

For more data, circle this page number on card at back →

Here Now! NEW CHEVROLET FIRST with the MOST

They're out to save you hours and dollars on any hauling job . . . and they've got big new power plus the modern features that make it a sure thing! They put you way ahead with time- and work-saving advantages you won't find in any other truck today!

Year after year—first with the most modern features! And again, for 1957, Chevrolet brings you the industry's most advanced truck features—new developments that have already been proved in a history-making preannouncement test run! (See below.)

For '57 there's bold new styling—rugged good looks to match Chevy's remarkable stamina and dependability. There's new

Alcan Highway Test Run Proves Chevrolet Ruggedness!

In an AAA-certified endurance run, 6 new Task-Force trucks roared up the 1,520-mile Alcan Highway (normally a 72-hour run) in less than 45 hours! In dramatic fashion, new Chevy trucks conquered one of the world's most challenging roads and proved their greatness!

A

TASK·FORCE 57 TRUCKS!

modern features

fleet-action power in Chevy's outstanding new engine line-up—with the 195-h.p. Loadmaster V8 standard in all 9000 and 10000 series trucks; and the sensational new 283-cu.-in. Taskmaster V8 (160 h.p.) standard in 5000, 7000 and 8000 series models. All told: *five* high-efficiency V8's and *three* economy-leader 6's in the truck line alone!

Many models are equipped with bigger, brawnier rear axles. And there's a load of heavy-duty options for '57 — including Chevy's revolutionary 6-speed Powermatic transmission, designed especially for heavy-load, high-mileage hauling.

Your Chevy dealer has all the details. When you see him, be sure to check the new cab features, too. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

The "Big Wheel" in trucks!

B

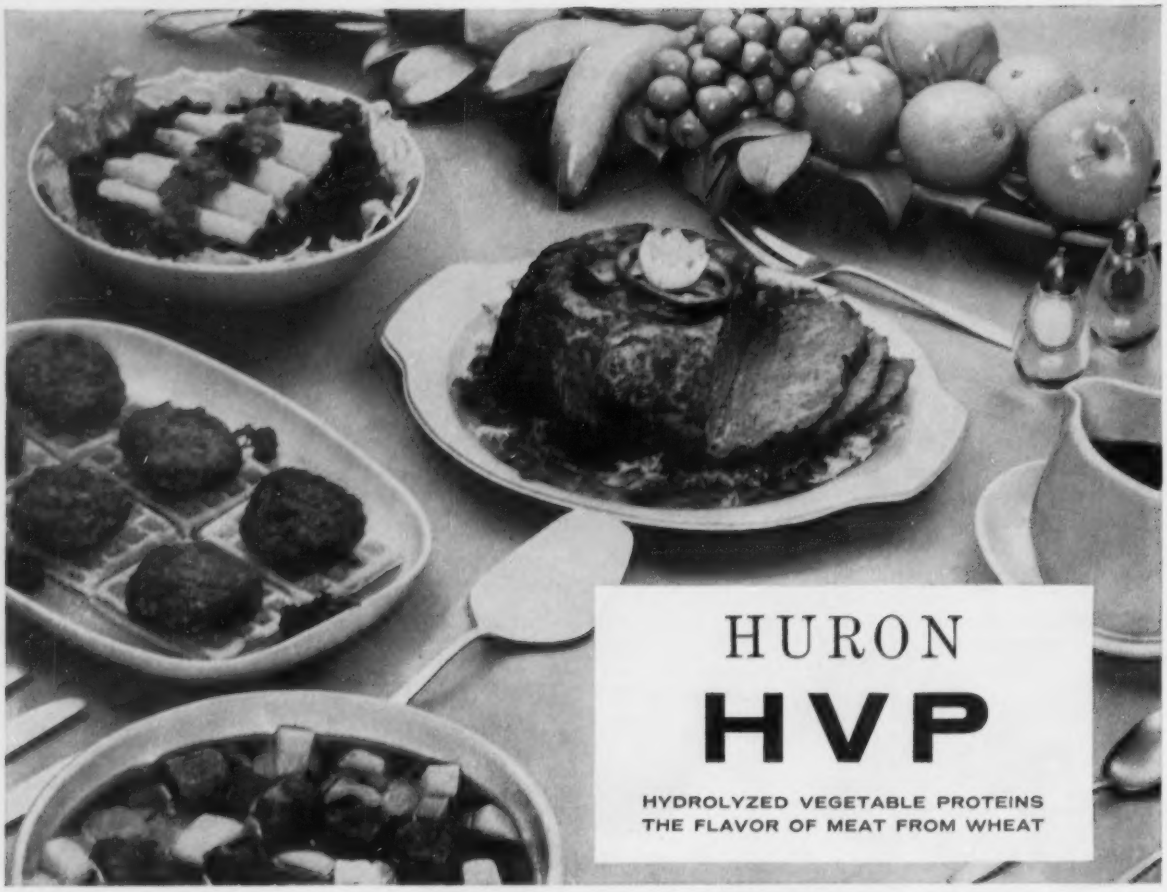
C

A. Cameo Carrier covered entire distance without stopping engine; averaged 18.17 miles per gallon!

B. New Super Taskmaster 283 V8 stole the power show, flattening an obstacle course of mud, gravel and grades!

C. 1,520 miles without shifting gears! Powermatic equipped heavyweight went all the way in a single forward-speed range!

For more data, circle this page number on card at back →



That good, oven-browned beef flavor *keeps 'em coming back for more!*

Flavors come alive with...

HURON **MSG**

Pure MonoSodium Glutamate 99+%

A taste-maker *and* a sales-maker, Huron MSG intensifies your own fine flavors to bring new taste thrills to processed meats, fowl, fish or seafoods, packaged dinners and other specialties from soups to sausage.

When you boost the taste-appeal of your products with Huron HVP, *your* brand preference and sales climb to new highs! Made from wholesome wheat protein, Huron HVP brings the rich, mouth-watering meatiness of oven-braised beef to canned, frozen and other prepared foods. Huron HVP enables you to control the flavor intensities of your specialty products. Huron offers you a complete line of HVP in liquid, paste, and powder forms. What's more, Huron will send a technical man to work out your flavor problems with you in your own plant. Write today for complete information and samples.

Only one place to get both these taste-builders—

THE HURON MILLING COMPANY

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Sales Offices: 9 PARK PLACE, NEW YORK 7 • 161 EAST GRAND AVE., CHICAGO 11 • 383 BRANNAN ST., SAN FRANCISCO 7 • 607 SECOND NATIONAL BLDG., CINCINNATI 2 **Factory:** HARBOR BEACH, MICHIGAN

Tips on Soft-Serves

—Continued from page 43

storage, and freezing should meet the sanitary and design features recommended by the 3-A Standards Committee of the Dairy Industries Assn.

Sterilization of equipment is an absolute must before mix comes in contact with it. Three general methods of sterilizing previously cleaned dairy equipment are usually accepted by public health authorities: (1) Live, clean steam; (2) hot water (minimum temperature of 180F.), or (3) chemical sterilization.

Chlorine types of chemical sterilizing agents are used more extensively than any others. It must be remembered that the use of sterilizing agents to kill bacteria is of no value unless the equipment has been thoroughly cleaned previously.

The process of freezing in a soft-serve unit will vary to some extent, depending upon design of the machine. In general, the freezer should be assembled and thoroughly sterilized before any mix is introduced.

When the freezer barrel is approximately half filled with mix, the dasher should be started and the refrigeration turned on. Whipping and freezing should be continued until proper consistency and overrun have been obtained.

Most freezers are equipped with an automatic control that will cause the refrigeration and dasher motor drives to cycle off and on if temperature of soft-serve goes below or above a predetermined point. If product is to be dispensed, the "dispense" setting is used to start the dasher and force the soft-serve out of the freezer barrel.

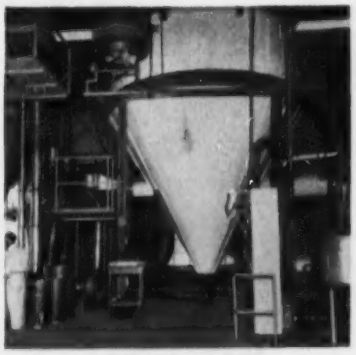
The freezer barrel should never be over- or underloaded with mix. Overloading will cause slow freezing, greater operating costs, low overrun, and a soft product. Underloading will cause excessive whipping and lower operating efficiency, and it may result in the dasher freezing in the barrel.

Special precautions should be taken to see that there is regular inspection of all bearings and similar items on a freezer that need lubrication. The refrigeration equipment should be thoroughly checked to assure availability of a proper amount of clean refrigerant. Electrical controls should be protected from excessive moisture. Care should be taken to see that motors are not overloaded or become too hot.

End (*Resume reading on page 45*)

Custom Drying ...Test Runs

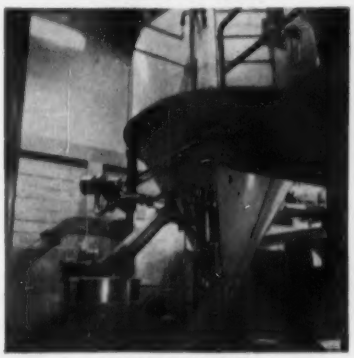
NERCO NIRO® Spray Dryers



COMMERCIAL UNIT

To meet your requirements for large tonnage custom spray drying, small and large scale test runs and batch testing, Nerco-Niro offers, at Netcong, New Jersey, the most completely equipped facility of its kind. Drying equipment includes:

1. **32" diameter laboratory unit.**
2. **7'-6" diameter pilot size unit.**
3. **16'-0" diameter commercial size unit.**



PILOT SIZE UNIT

Our plant incorporates:

- **Expert engineering supervision**
- **Process steam throughout the plant**
- **Jacketed feed pipes**
- **All stainless-steel equipment**
- **A large warehouse**
- **Railroad and truck sidings**
- **Modern materials handling equipment**

We invite you to take advantage of the great savings in expense, time and labor that are possible through using this Nerco-Niro service.

Write for Bulletin No. 232 for a more detailed description.

For more information return the coupon below.

Nichols Engineering & Research Corp.
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Nichols Engineering & Research Corp. - Nerco-Niro Div.
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Please send me more information on your spray drying laboratory services.

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Color your Foods SAFELY

BETA CAROTENE 'ROCHE' WITH VITAMIN A POTENCY

desirable YELLOW

safe YELLOW

uniform YELLOW

VITAMINS COME RIGHT FROM ROCHE

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good dollars and sense reasons for using BETA CAROTENE 'ROCHE' in your foods

TRUE NATURAL YELLOW COLOR – No tinge of green or red. True yellow from Beta Carotene 'Roche' means consumer satisfaction, repeat sales.

HIGH PURITY – Beta Carotene 'Roche' gives you uniform and constant color intensity.

NATURE'S OWN COLORING – Beta Carotene is a natural component of foods, in contrast with most other materials which have been used for coloring.

GREATER COLOR VALUE – Since 'Roche' Beta Carotene is pure, it provides more color per gram than concentrates of lesser purity. You get more for your dollar.

NEW LOW PRICE – A gram costs only 35¢. And if you're interested in vitamin A value you get 1.6 million U.S.P. units per gram inherently included at no extra cost.

NO OBJECTIONABLE ODOR OR TASTE – Another advantage to make your good food more easily sold.

SAFETY – Attested to because of its extensive presence in so many naturally safe dairy foods and vegetables.

ORIGINAL ROCHE DEVELOPMENT – Roche research and manufacturing advances have brought you a better product. *Beta Carotene comes right from Roche.*

PACKAGING – Packed as 24% semi-solid suspension (400,000 U.S.P. units of vitamin A activity per gram in vegetable oils) in sealed, sanitary metal packages.

Margarine Manufacturers

- Get convenience and economy
- Use blended vitamin A 'Roche' and Beta Carotene 'Roche' (with vitamin D_2 also if desired)

Fortify and color your margarine in one operation. Roche blends pure vitamin A and beta carotene in vegetable oil, makes delivery to you in sanitary tin cans. Ideal for batch mixing.

ADVANCES IN TECHNOLOGY

Processing Rice Paddy

An improved method of treating rice paddy to minimize final cooking time is covered by a recently issued patent.

The process comprises surface drying of the rice grains by heating to 102-123F. Then temperature is raised to between 140 and 248F. by direct injection of steam, and held until gelation of starch in the grains is substantially complete.

This is followed by rapid cooling to below 140F. and drying to 9-14% moisture.—U.S. Patent 2,758,031, Aug. 7, 1956.

Preventing Oxidation

Eliminating oxygen from the headspace of packages of products normally subject to oxidative deterioration is the subject of a recently patented process and product.

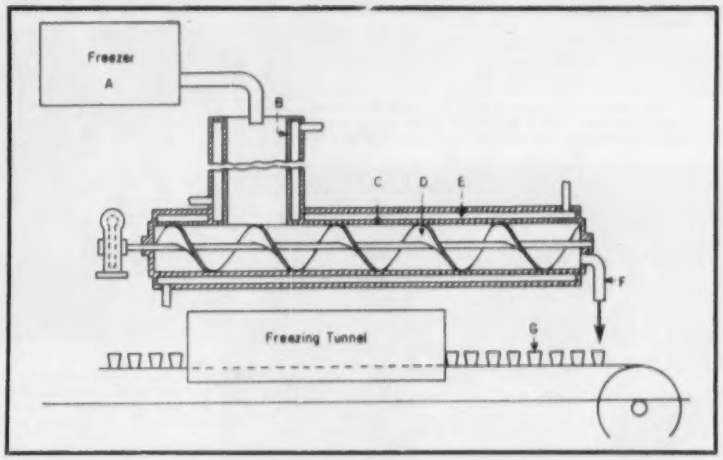
This is accomplished by introducing a deoxygenating substance into the hermetically-sealable container following filling. Recommended substance is a dispersion of water, glucose, and an enzyme system having glucose oxidase activity, contained in a moisture-proof, oxygen-permeable film.

After sealing, oxygen is said to diffuse through the permeable sheet and react with glucose, thus it is eliminated from the gas in the package.—U.S. Patent 2,758,932, Aug. 14, 1956.

Producing Sterile Milk

Rendering fluid milk products sterile and at the same time relatively free from cooked flavor and the tendency to develop a stale flavor is the object of a recently patented process.

The milk is sterilized prior to canning by heating to a temperature and holding for a time sufficient to produce an F_0 value of at least 5. Then O_2, in an amount required to oxidize the reducing substances produced by the sterilizing process, is introduced. This is said to practically eliminate cooked flavor produced through sterilization and, at the same time, reduce free O_2 to a point that stale flavors will not develop.—Canadian Patent 528,478, July 31, 1956.



Modifying Crystals During Freezing Improves Stability of Ice Cream

Many of the undesirable effects of lactose crystal formation in ice-cream can be eliminated by kneading the product to shatter the crystals, then mixing the fragments thoroughly with the colloidal mass and freezing at sub-zero temperature.

Steps in the patented process include:

1. Producing soft-frozen ice in conventional freezer (A in diagram above).

2. Transferring semi-frozen mass to refrigerated compartment (B) where it is hard frozen at 0-12F. until crystals become fully developed and are brittle in character.

3. Delivering the hard-frozen product to longitudinal conduit (C) which is equipped with motor-driven screw (D), and refrigerant-containing jacket (E). Here the ice cream is worked as it is moved to discharge pipe (F). This is said to fracture the brittle crystals and disperse the fragments through the entire colloidal mass.

An alternate method for accomplishing this step is use of an orifice-equipped compressor, comprising a cylinder, compressed air-operated piston, and a reduced discharge pipe. As cylinder forces ice cream through discharge orifice great pressure is applied to the crystals causing them to break into small fragments and, simultaneously, be mixed with the mass.

4. Kneaded product is discharged from pipe (F) into receptacles (G) which are conveyed through the hardening tunnel operated at a temperature of —20F. or lower.

In contrast to ice cream prepared in the conventional manner, this product is said to retain its form and not become porous or frothy when stored in a consumer's refrigerator at around 15F. Being homogeneous in structure, it melts uniformly and is said to be more palatable than ice cream as usually prepared.

A variety of apparatus can be employed in the process.—U.S. Patent 2,756,153, July 24, 1956.

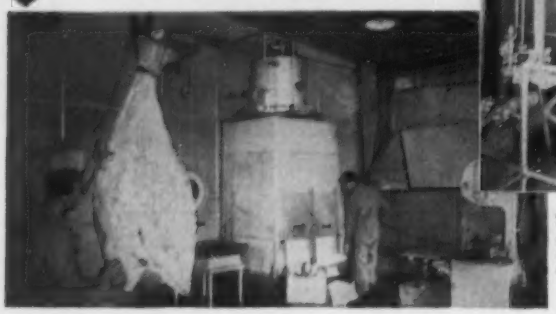
Process Uses Buttermilk In Ice Cream Mixes

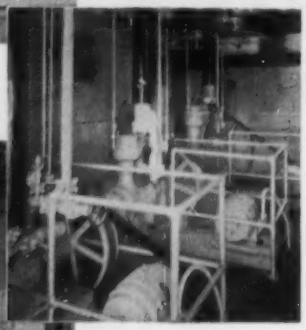
Buttermilk can be used as the main ingredient of dry ice-cream mixes provided certain precautions are taken to eliminate objectionable flavors and odors, and to insure uniformity in whipping action and keeping qualities. The procedure is revealed in recent patent specifications.

Extensive experimentation showed that the obstacles to be overcome in this connection were of two types, relating to: (a) Standardization of

View of the new Long Beach Seafoods Company plant in Long Beach, California. It imports a great quantity of seafood products from all over the world.

This new plant has three holding rooms kept at 0° F. and one freezer room with temperatures from −40° F. to −60° F. for the quick freezing of local fresh fish. Shown above is the room locating a Vilter Polarflake unit.





View showing the two Vilter vertical ammonia compressors and one vertical ammonia booster compressor.

Q. *Why is Vilter refrigeration so popular with this new seafood plant?*

A. because **Vilter** equipment provides outstanding performance and costs less to own*

Long Beach Seafoods Company, one of the West's progressive distributors and processors of seafoods, has in the past three years converted from 90% fresh and 10% frozen fish sales to 90% frozen and 10% fresh fish business. Because of this, it was decided to build an entirely new plant, using only the highest quality equipment. Previous experience of the owner with Vilter's excellent service record in his shrimp freezing plant influenced his choice of Vilter for his new plant. This customer is very pleased with Vilter equipment again giving continuous trouble-free service.

The heart of this refrigeration system is three Vilter two-cylinder ammonia compressors—two high pressure and one booster. For the ice maker, a Vilter Polarflake unit was naturally chosen to produce an ice assuring rapid chilling for the freshly caught fish. Polarflakes are cold, crisp flakes, which expose maximum chilling area to the fish and won't bruise or puncture them.

Vilter is your guarantee of refrigeration in the fish and meat industries that you can count on. Let Vilter engineer your next refrigeration job.

This equipment was sold by Vilter's California distributor, Refrigeration Machinery Corp. of Wilmington, California.

* Savings in low first cost are not the complete answer when considering the installation of refrigeration equipment. But savings in terms of years of extra service, reliable performance and minimum maintenance—that's where Vilter excels in low-cost ownership.

Vilter®

QUALITY CRAFTSMANSHIP that lasts ...

ENGINEERING DESIGN that guarantees performance

REFRIGERATION and AIR CONDITIONING

THE VILTER MANUFACTURING COMPANY, Milwaukee 7, Wisconsin

Air Units • Ammonia & Freon Compressors • Booster Compressors • Baudelot Coolers • Water & Brine Coolers • Blast Freezers • Evaporative & Shell & Tube Condensers • Pipe Coils • Valves & Fittings • Pakice & Polarflake Ice Machines

fat and lecithin content of the buttermilk, and (b) accurate temperature control in the drying process.

Skim milk, whole milk, and egg yolk are used to standardize the buttermilk. And temperature to which mixture is exposed in preheating prior to condensing and spray-drying must not exceed 163 F. for as long as 30 sec. Success is dependent on the simultaneous control of all these factors.

By way of example, a mixture of 700 lb. buttermilk, 185 lb. skim milk, 16 lb. whole milk, and 2.46 lb. egg yolk, is pumped through a preheater and raised to 163 F. for 20 sec. before it enters the evaporator. There it is condensed to 35-45% solids, and pumped, under pressure of about 3,000 psi., into a spray drier. Finished product contains about 5% fat, 91-92% milk solids, and 3-4% moisture. It can be used in baked goods as well as for ice-cream mixes.—U.S. Patent 2,757,092, July 31, 1956.

Factors Affecting Production Of Pre-Peeled Potatoes

In a recent study of pre-peeled potatoes, comparison was made between experiments in a well equipped laboratory and commercial operations in a plant having a capacity in excess of 6,000 lb. per hr.

Factors investigated included raw material selection, low-temperature caustic peeling, materials handling, heat transfer and refrigeration requirements, and other related problems. In all aspects of the study there were repeated reminders of the wide difference between laboratory or kitchen experimentation and plant practice.

Summary of laboratory experiments and observation on plant practices showed:

1. Low-temperature (below 160 F.) lye peeling is a feasible commercial operation. Compared with abrasion peeling, it usually results in reduction of peeling loss and trimming labor. These advantages are slightly offset, however, by a decrease in resistance to spoilage and occurrence of surface cooking.

2. Rapid cooling of pre-peeled potatoes is necessary to insure maximum protection against microbial spoilage and discoloration. This can be accomplished in part by refrigerating the treating solution, and additionally by cooling in refrigerated storage rooms.

3. Color intensity of French-fried potatoes can be reduced by a hot-water blanch before frying.

SERVING INDUSTRY WITH "COLLOIDS OUT OF THE SEA"

SeaKem EXTRACTS

An ADVERTISEMENT by and about SEAPLANT CHEMICAL CORPORATION of New Bedford, Mass.

PROTEIN REACTION

Can Mean Better Products

In earlier issues, we've referred to the fact that Irish Moss Extractives have the ability to work "in combination" with milk and other proteins to exhibit extraordinary properties. (Vol. III, No. 1, page 4 et al.)

Latest evidence of this fact was presented in a paper by Elmer F. Glabe and associates of Food Technology, Inc., Chicago, at the June 12 convention of the IFT in St. Louis. Title of the paper was "Applications of Irish Moss Extractive-Protein Reaction in Food Products." From all reports reaching us, this work was received with a good deal of interest in St. Louis.

The paper discussed the ability of certain Irish Moss Extractives to exhibit reactions with the proteins of egg white, soybean and milk and to show measurable reactions with wheat flour (presumed to be with the gluten or protein portion).

In his paper, Mr. Glabe went on to point out that commercial applications of this reaction are indicated as follows:

1. As a flour conditioner in bread baking, performing useful functions not always possible with oxidizing agents. Commercial bread baking experiments have shown that Irish Moss Extractives can impart longer mixing tolerances for the doughs and in more uniform exterior loaf characteristics, mainly ovenspring. These results were shown on flour doughs which failed to respond in similar fashion to the known oxidizing agents, potassium bromate and potassium iodate.

2. As an ingredient in prepared cake mixes, supplementing egg white. In a series of white cake tests with 1.5% egg albumen, addition of Irish Moss Extractive in dry state produced notable effects on the cake characteristics. Texture was improved and this feature was especially noticeable after storage of the cake in comparison with a control. Other characteristics were as good as the control. Hypothetically, the reaction with the egg and the flour proteins could be responsible.

3. As an additive in alimentary paste products for improving resistance to breakdown during cooking and processing during canning. In tests, spaghetti produced commercially from a mixture of durum semolina and hard wheat farina responds to the presence of carrageenin by showing decreased sensitivity to cooking. Commercial tests were made including in the spaghetti dough 0.2%-0.3% of the Extractive. The dried spaghetti was then subjected to a cooking period of 20 minutes in boiling water. The cooked spaghetti was then examined by a taste panel of four people who tasted for degrees of softness and resiliency as measured by mouth feel. In these tests the panel consistently rated the spaghetti containing Irish Moss Extractive as firmer and having less tendency to show lack of resiliency during chewing. *al' dente!*

"Quick-Cook" Pudding

If you'll forgive us a little boasting, we're rather proud of our idea for "Quick-Cook" pudding. With it, you bring the milk to a boil as quickly as possible. Then the pudding mix (any of the usual flavors) containing a SeaKem milk gelling agent is added to the milk. The material goes right into solution with a minimum of stirring and without lumps. After cooling and setting, it's ready to eat.

Puddings made this way have all the advantages of boiled pudding without the disadvantage of constant stirring. And perhaps even more important, there is no possibility of scorching.

Tastes great, too.

More information? Let us know.

Stuff for Stuffing

If you've been looking for a boiled cream filling for stuffing eclairs or what-have-you, go no further, friend.

We don't have the last word on flavor (we'll leave that up to you) but we do have a starting formula that fills the bill on consistency thanks to Our Favorite Product. If you'd like a copy, let us know.

Pumpkin Pie

With Turkey Day forthcoming, it seems that we should mention that bit of Americana known as Pumpkin Pie. Yes, it's true that SeaKem Stabilizers are to Pumpkin Pie what cranberry sauce is to a turkey dinner. The stabilizers help to avoid the traditional problems with commercial Pumpkin Pie fillings such as cracked surfaces, poor mouth feel and other defects which decrease consumer acceptance.

Laboratory studies of Pumpkin Pie fillings, together with commercial application of the results of the studies have been made over an extended period. This work has included pie bakers as well as several canners of ready-to-use pie fillings. The work has demonstrated that SeaKem Type 3, used as a bodying and "custardizing" agent offers the following distinct advantages:

1. Requires fewer eggs to obtain desired custard and thus cuts costs.
2. Overcomes unsightly surface cracking.
3. Produces pie slices which hold shape, yet are delicious and appetizing.
4. Prevents wheying off of pumpkin, either in a pie shell or in a canned ready-to-use filling.
5. The filling is non-sticky and extremely easy to handle in the bakery, or, if canned, it releases easily and cleanly from cans.
6. Produces pies with virtually no skin formation and with a highly attractive sales producing gloss or sheen.

For further details write for Technical Bulletin No. 122.

CONTINUED →

Quickies

- The items on these pages are from recent issues of our house organ, published under this same SeaKem EXTRACTS masthead . . . regular issues also include technical discussions pertinent to colloidal problems . . . To be put on mailing list, just check the coupon on page 2.

- Known more familiarly as Irish Moss Extractives, nature has provided an abundance of the source material from which SeaKem "Colloids Out of the Sea" are derived—and years of experience have proved the usefulness of these red sea plants in gelling, thickening, emollient and demulcent applications. However, real growth had to wait until modern technology could unscramble the intricacies of producing—on a tonnage basis—uniform, tailor-made extractives derived from an incredibily complex source material . . . Today, SeaKem Stabilizers are contributing important advantages to more than a hundred different food products ranging from chocolate milk and ice cream to salad dressings and frosting mixes. Our complete story is told in an 8-page brochure entitled "Colloids Out of the Sea" . . . yours for the asking.

- Another excellent industry story is a special report on Seaweed Colloids by Bernard Idson in the July 21 issue of *Chemical Week*. Reprints are available upon request from McGraw-Hill.

SeaKem EXTRACTS An ADVERTISEMENT by and about SEAPLANT CHEMICAL CORPORATION

Squeeze Me a Little Jelly, Nelly

New ideas are the vitality of any industry so we're glad to see that foods in tubes seem to be gaining acceptance. (We're especially glad because it represents a market for us.)

We note that products such as imported preserves, ketchup, icings, toppings and similar goodies have been well received abroad and in some cases here in the U. S.

Naturally, there's no fooling with the vagaries of consistency when you use this kind of packaging. All you need do is splatter your mother-in-law's plisse pinafore one time with Klein's Klassy Ketchup and old man Klein has forever lost a customer.

Anyway, consistency is one of our premier products, thanks to Irish Moss Extractives. So, if you're putting a product in tubes or plan to do so, consult with us. Chances are we may be able to save you from grief. At least we'll try.

Modified Starch Substitute

As everyone knows, recent and considerable development work has resulted in many new and pregelatinized and modified starches.

In our own work on salad dressing and other applications, we have found that much of the undesirable taste and the retrogradation of raw starches can be eliminated or reduced if a mixture of raw starch and carrageenin is used.

In short, in place of an expensive modified starch, a combination of low cost raw starch and carrageenin can sometimes be employed and the economics of the latter combination are very attractive.

As a rule of thumb, we find that half the normal amount of raw starch replaced by 1/10 its weight of a SeaKem Irish Moss Extractive, is a good starting point.

We don't want to give the idea that combinations of raw starch and Irish Moss can replace all applications of all modified starches. They certainly can't—and modified starches do, indeed, have their place. But the modification of raw starches with Our Product has many highly useful applications, not the least of which are milk puddings and pie fillings.

It's just one more example of that "in combination" advantage we're always talking about.

Speedy Chiffon

It used to be that it took 20 minutes to whip up a good chiffon filling. Now Our Favorite Company has come up with an instant chiffon. "Well," as a popular TV comedian says, "not really instant. It really takes three whole minutes or so." We've got an institutional formula for Butterscotch, Vanilla and Lemon that's pretty terrific. Won't work for chocolate, though. The cocoa butter melts and destroys the whip.

If you'd like the formula, we'd like to send it to you. We'll be glad to reserve a couple of drums of SeaKem Type 102, an essential part of the formulation. Just request "Starting Formula for Chiffon."

A "Slip" You'll Like

An interesting—and unexpected—property of Our Product has been noted in a number of canned products—especially dog foods and pumpkin pie fillings. The SeaKem Stabilizer greatly improves releasing qualities, gives them "slip" for easy removal from the can. Of course, that's not the purpose of the Stabilizer in these and similar products but what customer will object to getting more for his money than he bargained for?

Meringue Stabilizer

Here's more good news for Bakery Supply Houses and Institutional Suppliers. We've recently developed a stabilizer for hot process meringues. It's composed of a dry blend of cane sugar, SeaKem Type 202, corn starch and corn sugar (to help develop the golden-brown peaks).

It insures a meringue that is full in height, evenly moist and not toughened. If you'd like a copy of our suggested starting formula, let us know.

Fudge Base

In line with our long-established and time-honored policy of furthering the interests of our many friends in Bakery Supply Houses, we've worked up a starting formula for a stabilized fudge base for bakers. It could be packed ready to use by the baker.

If you're a bakery supply house, let us know and we'll be happy to see if we can help you work out a potentially profitable package.

did you know?

. . . that SeaKem "Colloids Out of the Sea" are uniquely different both in their reactivity with proteins and their ability to work well "in combination" with other colloidal materials.

. . . that because of their reactivity with milk in any form, soya and egg proteins, very small amounts of a SeaKem Stabilizer often will react with, and thus bring into more effective play, naturally-present ingredients, making possible formulation accomplishments and production economies users call "incredible."

. . . that SeaKem Stabilizers can be used as "tool" ingredients "in combination" with other colloidal materials (starches, locust bean gum, carboxymethylcellulose, etc.) to build behavior and advantages which cannot be obtained from any one of these ingredients alone.

SEAPLANT CHEMICAL CORPORATION

63 David St., New Bedford, Mass.

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Please send me more information on the following items: _____

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Please send me your "Colloids Out of the Sea" brochure ☐

Please put me on your Sea-Kem EXTRACTS mailing lists ☐

Please send me information on the following special application: _____

_____

Your Name: _____ Title: _____
(Please Print)

Firm Name: _____

Address: _____

City and State: _____

4. Undersized potatoes and small cut pieces unsuitable for French-fry sticks can be processed to make hash-brown potato stock for use in restaurants.—*Food Technology*, 347-51, Aug. 1956.

Dry Packaging Materials Desiccate Frozen Foods

Moisture absorption from frozen foods leading to surface desiccation can occur if the packaging materials are dryer than their equilibrium moisture content at the storage temperature.

When initially dry wood specimens (white and jack pine, basswood, white birch, and white oak) ¼-in. thick were subjected to air at 0 F. and 98-100% relative humidity, moving at 100-200 fpm., the moisture absorption rate depended on whether the specimen was heart or sapwood, and on whether the air movement was parallel to, or across, the grain.

White pine or bass sapwood achieved equilibrium at about 19% moisture in 21 days, while white oak heartwood took about 6 times as long. Paper boards take up moisture much faster than wood and reach equilibrium at 10-17% in 3-14 days.

The moisture absorbing effect at low temperatures can be avoided by preconditioning the materials at higher temperatures in air of appropriate relative humidity. For example, air of 80% r.h. at 68 F. is saturated at 0 F., and packaging materials equilibrated at the higher temperature and lower humidity will not take on moisture at the freezing temperature. Desiccation can also be avoided by adding moisture to the storage room to make up for that absorbed by packaging materials.—*Canadian Journal of Technology*, 34(5), 366-72, 1956.

Determining Pigment Content Of Cooked Pork Products

Although visual estimation of depth and stability of color of cured meats is the usual practice, a simple and reasonably accurate colorimetric method has been developed that is especially useful for study of distribution and fading of color in cooked pork products.

The method requires extraction of a minced sample of lean meat with an 80% acetone in water solution, followed by measurement of the light absorption of the bright red acetone extract at 540 mmu.

Using 10g. of meat and a total

a fish story that's true . . .
about **Oakite Chlor-Tergent**

Recently a fish packer in the Great Lakes area tried Oakite Chlor-Tergent for cleaning and freshening his plant. It did a fine job, but he didn't realize how fine until a few minutes later, when a regular caller came in. The caller looked around, sniffed. He was puzzled. "Where's the fish smell?" he asked. There just wasn't any!

In food plants, Oakite Chlor-Tergent does triple duty. It cleans—fast and thoroughly. It sanitizes—kills bacteria on contact. It deodorizes—not by covering up odors, but by going directly to the source and rendering them inert.

And here's an important point. Many chlorinated sanitizers lose much of their chlorine activity during ordinary usage—meaning that bacteria-killing power has been reduced before the cleaning is finished. Oakite Chlor-Tergent maintains the bactericide ability to a high degree.

What's more, Oakite Chlor-Tergent is effective in concentrations as low as ½ oz/gal., which makes it amazingly economical. Ask your local Oakite Technical Service Representative to demonstrate. Or write to Oakite Products, Inc., 27A Rector Street, New York 6, N. Y.

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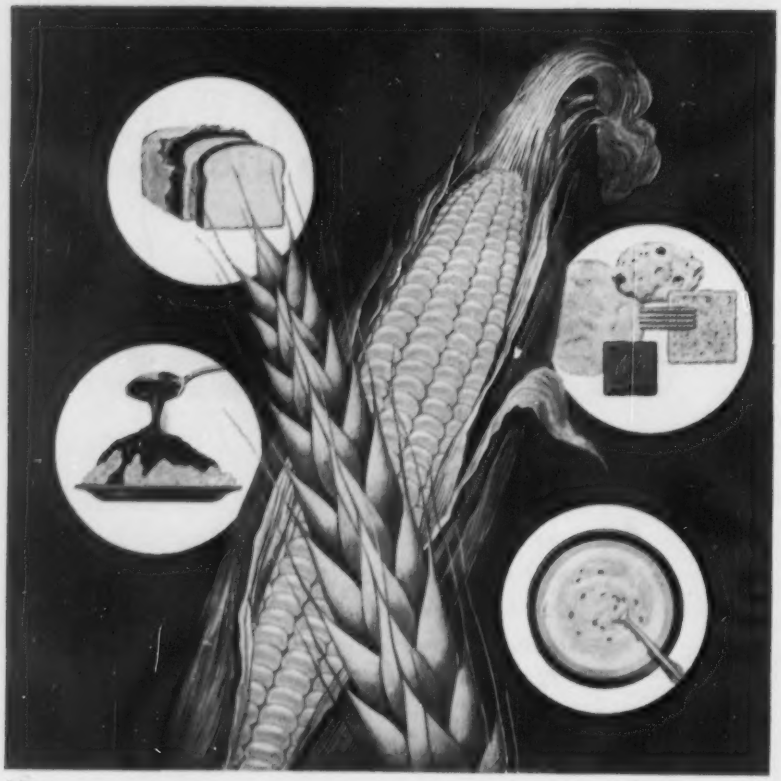

RHOZYME

Diastatic Enzymes

modify starches at low cost

RHOZYME Diastatic Enzymes bring about specific, controlled action without producing undesirable side reactions. This lets you solubilize, saccharify, or modify food starches without sacrificing other properties vital to good products or processing.

This selective action of the RHOZYME family makes them a low cost, efficient answer to processing problems such as:

PROCESSING OF PRE-COOKED CEREALS—by reducing viscosity of mash for more efficient roller-drying

PRODUCTION OF CORN SIRUP—by saccharifying corn starch in making sweet, non-bitter sirups

PRODUCTION OF COCOA SIRUPS—by lowering viscosity so that sirups pour readily

BREAD-MAKING — by modifying bread starch to give better texture and grain and better shelf life

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fluid volume of 50 ml., absorption of the acetone-nitroso-heme solution at 540 mmu in a 1 cm. cell, multiplied by 290 gives the concentration of nitroso pigments in the meat as ppm. of hematin. If the solvent contains hydrochloric acid, absorption of resulting extract at 640 mmu becomes a measure of the *total* heme pigments in the meat.—*Journal Science of Food & Agriculture*, 7(8), 534-40, 1956.

Making Soluble Coffee

Reversing the customary method of making soluble coffee concentrate by extracting roasted beans, a patented process extracts raw beans and roasts the dry concentrate.

Extraction is made in two steps: (1) At a low temperature to obtain the aroma-yielding constituents, and (2) at a high temperature to obtain an economical yield and to impart body to the final product.

Crux of the process lies in almost immediate drying of the low-temperature extractive which is unstable and tends to decompose due to presence of enzymes. A single extraction can be made by using continuous counter-current flow of water, applying the hottest water to the almost spent coffee and the coolest to the untreated grounds.

For this extraction preferred temperature range is 60-100 F. Duration is limited to 2 hr., and no greater elapsed time between extraction and spray-drying.

High-temperature extraction is carried out at 212-300 F. In both cases, separation of liquid is made by pressure filtration, and the preferred method of evaporation is spray-drying.

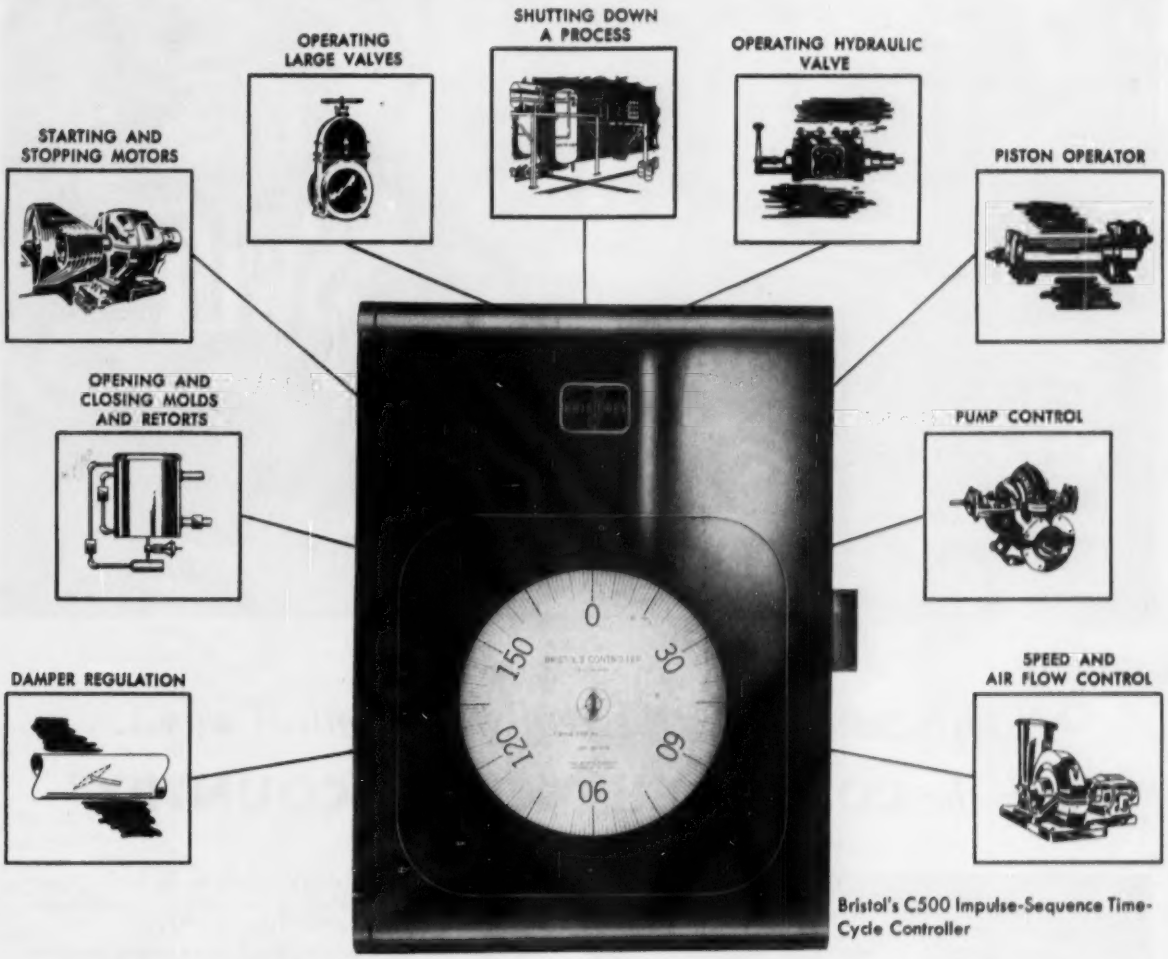
Combined dried concentrates are then roasted at a temperature of 410 F. for 15-17 min. As the roasting proceeds the powder goes through a plastic stage and foams, ultimately forming a dry, friable, porous mass that is readily pulverized.—U.S. Patent 2,758,927, Aug. 14, 1956.

Antioxidants Stabilize Red Color of Peppers

Color stability in peppers is increased by antioxidants regardless of whether instability is due to variety, strain, or harvesting practices.

Use of antioxidants to preserve the carotene of alfalfa by a spray process suggested a like application in stabilizing the carotenoids of peppers. Antioxidants tested were those shown to be effective in preserving

WHAT'S NEWS AT BRISTOL . . .



Bristol's C500 Impulse-Sequence Time-Cycle Controller

AUTOMATIC TIMING . . . THE KEY TO AUTOMATION

In almost every plant you'll see operations that *must* be carried out according to definitely timed sequences.

Experience has shown that such operations can be controlled with greater precision by automatic time-cycle controllers than by any other method—and when accurate timing is *continuously* maintained, here are the happy results:

- production from given installed equipment is increased
- uniformity of product is assured
- rejections are almost wholly eliminated
- operators are released for other important duties

Automatic control also puts the process under direct measurement—which means that operating conditions are more easily determinable and more easily reproduced.

Which controller should you select? Hundreds of leading industrial firms, many of them Bristol customers for over 66 years, are using Bristol Automatic Process-Timing Controllers. Our engineers have had long experience in the application of Automatic Process-Timing Controls in practically every industry. They're ready to work on your problem now. Write today for our Bulletin C305. The Bristol Company, 115 Bristol Road, Waterbury 20, Conn.

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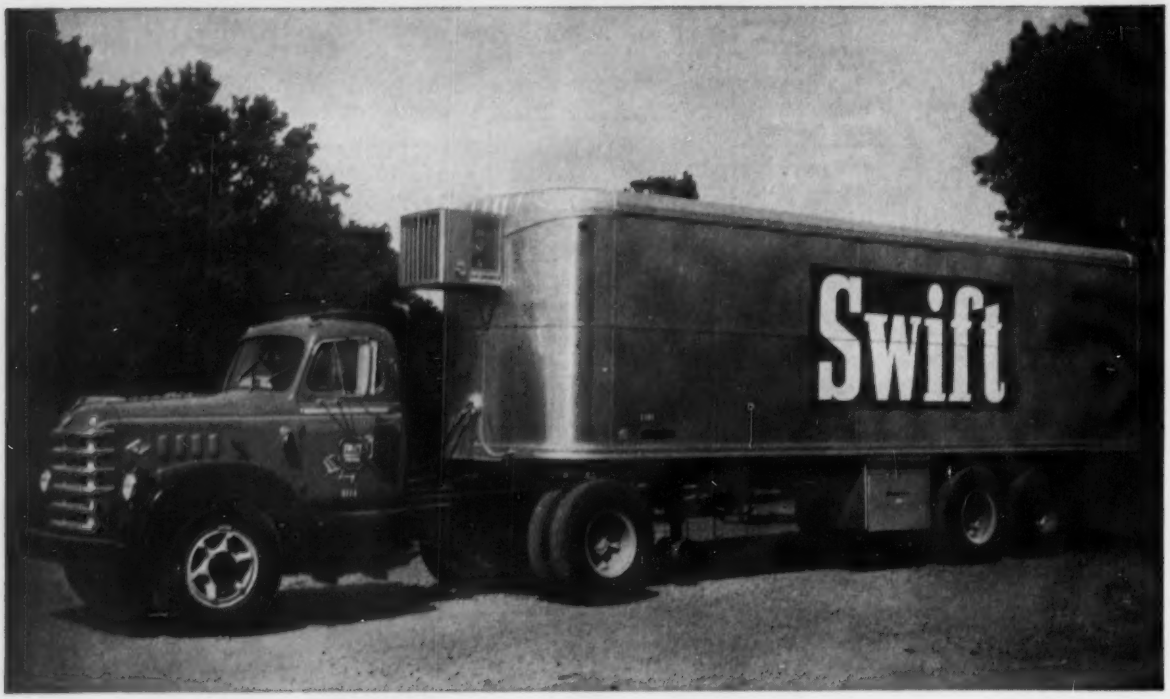
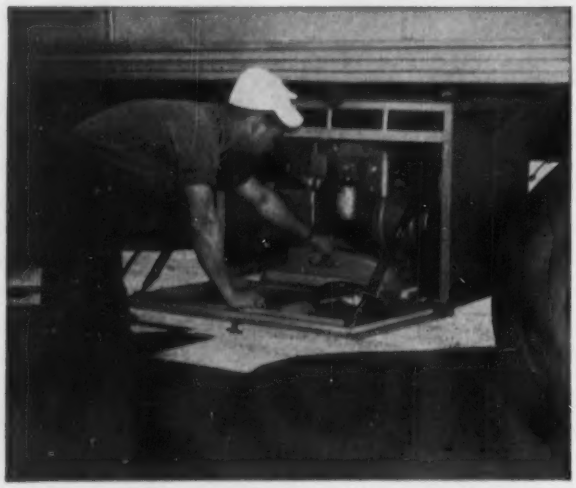


Refrigerate trucks the really economical way... with the COLDMOBILE "CROSS-COUNTRY"



Exclusive design cuts operating and maintenance costs. The power unit mounts beneath the trailer...has flexible gas and electrical connections that permit the entire unit to be pulled out for easy accessibility.

Keep meat, poultry, dairy products—in fact, all perishables—fresh, whether on the road or at the dock, with the Coldmobile "CROSS-COUNTRY" (Model TR-15). The Coldmobile TR-15 saves money from the very beginning with a moderate initial cost. Its hermetically sealed design eliminates the need for belts, pulleys, jackshafts, clutches or unloading valves. The refrigeration unit mounts on the front wall of the trailer...doesn't waste cargo space.

Dependable Refrigeration When Parking. It's a simple matter for the driver to throw a switch connecting the refrigeration unit with the engine generator and press the starter button for sure, immediate starting. Or the generator can be switched off, permitting the refrigeration unit to operate on "plug-in" power.

Automatic Defrosting and Automatic Temperature Control. With the Coldmobile TR-15 the driver is assured of steady, efficient cooling at all times. There's no need to check the temperature, or take time to defrost the unit.

On-the-job performance proves the Coldmobile TR-15 provides new low-cost protection for interstate or cross-country hauling. For complete information, write—

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COLDMOBILE DIVISION
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2900 W. VERMONT STREET, BLUE ISLAND, ILLINOIS

the carotene of alfalfa meal, or were fat-soluble ones commonly used for food products.

Effective in reducing loss of red color of paprika and cayenne peppers were 0.1% concentrations of Santoquin, DPPD, BHA, 2, 5-di-tert-butyl-hydroquinone, the 2, 5-di-tert-amyl-hydroquinone, and 6-phenyl-2, -2, 4-trimethyl-1, 2-dihydroquinoline. Alpha-tocopherol or BHT were ineffective at concentrations of 0.1 or 0.5%.

Peppers treated with 0.1% Santoquin were more resistant to discoloration by ultraviolet light or sunlight than untreated peppers. Spraying-dry pepper with mineral or cottonseed salad oil did not increase color retention, nor did spraying with oil plus BHA or BHT increase the effectiveness of the antioxidants.—*Food Technology*, 403-5, Sept. 1956.

Dried Egg Whites

Improvement in the whipping and baking properties of dried egg whites is claimed for a patented process in which certain aliphatic polyhydric alcohols are incorporated in the glucose oxidase-catalase treated egg liquids before drying. Glycerine and sorbitol are said to be satisfactory for the purpose.

In practice, liquid egg whites are subjected to treatment with glucose oxidase and catalase in the presence of H_2O_2. Treatment is continued long enough to effect a reduction of at least 50% of the content of free reducing sugars, particularly to a range of 0.01-0.03% by weight of liquid egg whites.

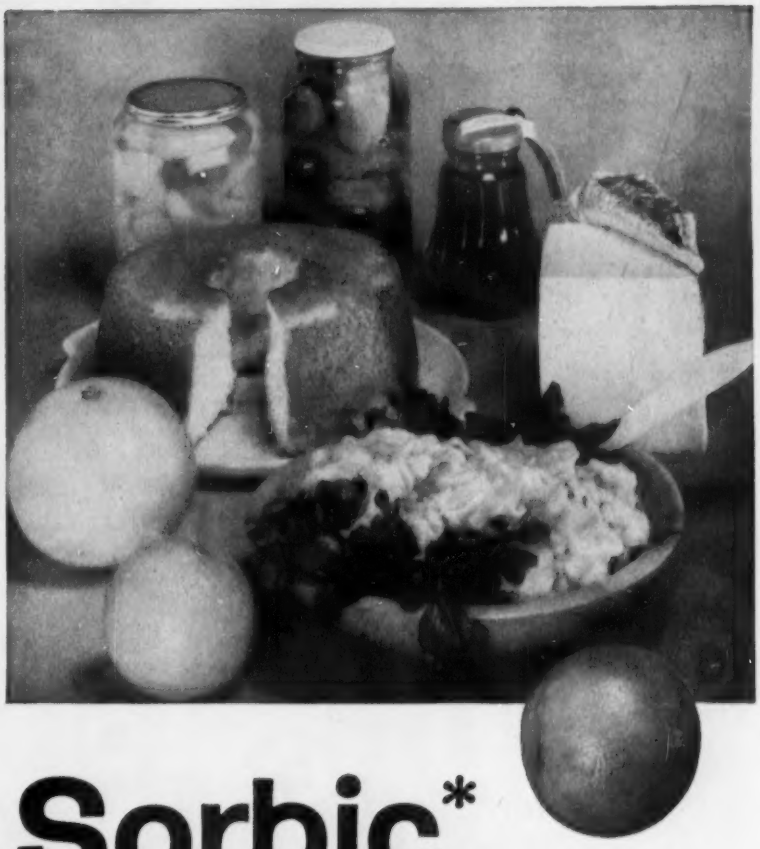
On completion of this treatment, 4-22% glycerine or sorbitol is added and mixture is dried in any suitable manner.

Product is claimed to have superior properties in relation to odor, whip, sugar-carrying capacity, and freedom from discoloration on aging. Mixes containing it have outstanding shelf life. — U.S. Patent 2,758,933, Aug. 14, 1956.

Explosive Characteristics Of Elevator Dusts

Explosions in which dusts from handling of cereal grains in elevators are the ignitable material appear to be more likely when the dust is finer than 150 mesh. Elevator dusts with the 150 to 200 mesh fraction removed can be exploded, but only at concentrations at least twice that required with the original sample.

Explosive limits vary from 0.10—



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- Controls growth of many molds and yeasts.
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For further information on how you can protect your food product with Sorbic, write the CARBIDE office nearest you for Technical Bulletin F-6568. Offices in principal cities. In Canada: Carbide Chemicals Company, Division of Union Carbide Canada Limited, Montreal.

*CARBIDE's *refined sorbic acid for use in foods.*

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Hydraulic range includes capacities to 600 gpm., heads to 160 feet.

Pedestal assemblies available for base-mounted coupling connections.

Close-coupled connections fit NEMA standard pump motors.

New, high-speed pumps for handling clear liquids and fine slurries not corrosive to GR. 316 SS.

Although stock items, these pumps include features which, until now, have been available only on special order for custom-built models:

1. *Correct-design closed impellers* — for greater efficiency, longer life.
2. *Wear rings* — to save the casing, prevent expensive repairs, reduce down-time.
3. *Shaft sleeves*—to give greater operating economy, eliminate worn shafts, cut maintenance costs.

Ask your Ampco Pump Distributor to show you how these off-the-shelf pumps are easily adapted to the particular requirements of your specific application. Write for his name—and Bulletin P-3C.

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PR-23

1.40 g./l. of air (0.00625-0.0875 lb. per cu. ft.) depending on moisture content and test equipment used. Corresponding limits for corn starch were 0.035-0.32 g./l. Relative humidity of the air between 10 and 50% had no measurable effect on the explosive limit.

Dusts containing up to 41.7% ash were explodable, the ash simply acting as a diluent of the combustible material. Dusts from elevators handling different grains had the same explosive limits for the same size-moisture-humidity relations.

Most explosive dusts are fines from cyclone discharges which range from 6.56-10.22% moisture (average, 8.09) and 10.4-29.2% finer than 150 mesh (average 18.4%). Efficient dust control equipment and housekeeping that keeps static dust to a minimum will reduce dust explosion hazards and prevent minor explosions becoming major disasters. —*Canadian Journal of Technology*, 34(5), 260-67 1956.

Bitterness in Beer

During boiling of hops, humulones are transformed into the iso-humulones, (isocohumulone, isohumulone, isoadhumulone) and these soluble derivatives give beer its hop-bitter flavor.

Their separation and identification was carried out by counter current distribution analysis. However, a simple extraction of hops, worts, or beer, with iso-octane or benzene, followed by a spectrophotometric measurement on the extract diluted with methanol, permits a rapid estimation of the hop bitter substances present.

With this method it is possible to control quantity of hops used according to their alpha-acid content and to produce beer of uniform bitterness. At Carlsberg Breweries (Copenhagen) beers are allowed to vary in iso-humulones only ±1.5 mg./l. Since it takes a difference of 4 mg. to be detected by taste, bitterness is thus held constant.—*Brygmesteren* 13, 5, 109-23, 1956 (Danish); also *Brauwelt* 96, 46, 759-64, 1956 (German).

Yeasts of Cucumber Brines Do Not Cause Softening

Softening of cucumbers during salting has been shown to be due to a polygalacturonase-like enzyme which splits the polymer linkage of pectic substances. Its origin may lie in the biological activity of micro-

WHICH WILL SHE REACH FOR?

Why are the nation's food retailers finding out that artificially sweetened foods and beverages certainly are "non-filling" as far as their cash registers are concerned?

On the average, for each $10,000 of business volume, stores make *only 72 sales a week from a total of 69 different items and brands* of dietetic products stocked!*

Let's look at this "big market among overweight people". The simple fact is that very few of the overweight people who make up this so-called "big market" actually need, or buy, artificially sweetened products. *Even among the small percentage of dieters who do use them, they are not popular.***

It takes a lot of promotion of so-called "non-fattening" foods to get people to use these products. *This can only undermine consumer confidence in your top-selling sugar-sweetened lines* by the misleading inference that they *are* fattening.

That's why we are continuing to tell people the latest facts about the real nutritional value of sugar—to help keep them reaching for your good products that contain it.

Sources: * *Progressive Grocer's "Foodtown Study of Supermarket Sales".*

** *Study on use and acceptance of artificially sweetened products by several hundred overweight people, recently reported in Journal of American Dietetic Association (April, 1956).*

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All statements in this message apply to both beet and cane sugar.

PROTECTION is our business, too

Just as the "everyday" heroes of our nation's Coast Guard risk *their* lives to protect *our* lives—Jones & Laughlin Steel Containers protect your products by providing dependable packaging that assures safety in transportation and storage. Precise fabrication provides accuracy in all fittings and closures.

J&L drums and pails are chemically cleaned and dried by the JaLizing process. This assures a clean and dry, rust-inhibiting surface and increases the adherence and durability of decoration and interior lining.

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organisms present in cucumber brines, or it may originate in the cucumbers themselves.

To test ability of yeasts to produce a pectin-splitting enzyme, 139 cultures representing 15 genera and 61 species and strains were screened for their ability to hydrolyze citrus pectin by both de-esterification and glucosidic hydrolysis. Cultures were obtained from commercial cucumber brines, as well as from other brined, salted, and pickled materials; 31 species came from yeast collections.

Of 6 genera and 21 species that were able to de-esterify pectin, three were found on the surface of commercial cucumber brines. Six of the cultures were able to produce glucosidic hydrolysis of pectin. None came from cucumber brines.

From these results it appears that the surface and sub-surface yeasts of cucumber brines are not the source of the salt-stock softening polygalacturonic enzyme.—*Applied Microbiology* 4(4), 196-201, 1956.

Palm Kernel Stearins As Cocoa Butter Extenders

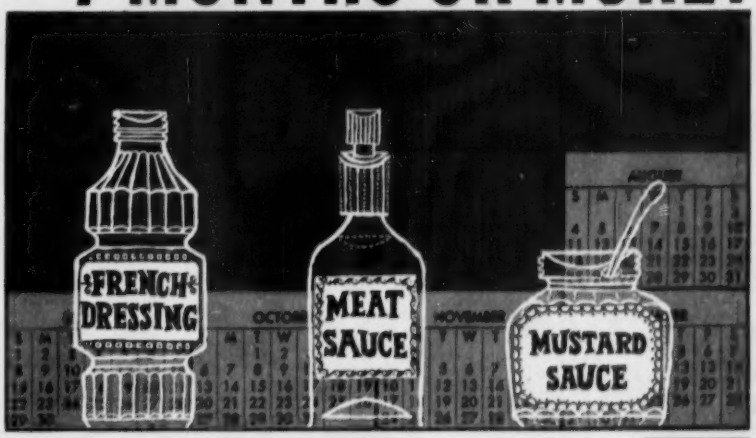
Using a calorimeter designed for measurement of thermal characteristics of fats and determination of their solid and liquid phases, 8 commercial fats of the palm kernel stearin type were studied with a view to their suitability for mixture with cocoa butter and subsequent use in confectionery.

When percentage of liquid phase was made a measure of plastic properties, most of the fats were similar to cocoa butter in hardness, but showed a greater degree of softening on warming. Mixtures of stearins and cocoa butter in proportions that would occur in a plain chocolate would be very soft and would show finger marks easily.

A milk chocolate containing equal quantities of palm kernel stearin and cocoa butter would resemble a chocolate made with cocoa butter and a high proportion of milk fat.

Products containing palm kernel stearin alone should be tempered at high temperatures and for a shorter time than for cocoa butter alone. With cocoa butter present, temperatures can be lowered and time increased. With milk fat present, temperature can be lowered still further, but for any given cocoa butter level replacement, tempering changes relative to an equal cocoa butter content are not likely to be influenced by milk fat content.—*Journal of the Science of Food & Agriculture* 7, 425-36, 1956.

At last! Positive way to SOLVE INSTABILITY of food emulsions -- 7 MONTHS OR MORE!



KELCOLOID hydrophilic colloid

lengthens shelf life of French and Salad dressings, meat and barbecue sauces

You produce stable and uniform emulsions of superior flavor release and natural color with Kelcoloid. This easy-to-use hydrophilic emulsifying colloid improves consistency, gives smoother textured dressings of higher gloss.

for French dressings:

Extensively used in French dressings, Kelcoloid gives greater emulsion stability and markedly increases shelf life. Even when dressings are subjected to either high transit and storage temperatures, or refrigeration, Kelcoloid protects against body breakdown and separation.

for salad dressings and food spreads:

For softer, smoother texture add Kelcoloid to produce a desirable body that resists cracking and oil separation even on long standing.

for barbecue, meat, seafood, and mustard sauces:

With Kelcoloid you produce a properly stabilized product with optimum body and clean full flavor. Shelf life is increased for Kelcoloid maintains uniform emulsions longer.

For finer food emulsions Kelcoloid is well worth your immediate evaluation.

YOURS ON REQUEST: Free Kelcoloid Sample and Technical Bulletin, fully describing application of Kelcoloid in food emulsions, yours without obligation. Write today.

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Ultra-Modern Bakery

—*Continued from page 49*

side of the axle is bent in a sharp arc upward to form a ratchet. Dogs on the power conveyor engage with this ratchet to move the rack forward.

Design of this lever is such that it operates in a rocking action. When forward part is depressed, ratchet is raised to a point where conveyor dogs will engage it. When forward part is elevated, ratchet becomes disengaged. The axle extends outward from the side of the lever about 3 in. toward the right side of the rack.

In normal position, the fore part of the lever, being heaviest, is depressed. This permits the powered chain conveyor to engage the ratchet and move the rack along the monorail. When the extended roller strikes the inclined plate on a stationary rack, it rolls up, depressing the ratchet, disengaging it from the power conveyor, and stopping the rack.

When charging cooler with loaded racks, alternating switch at feed end automatically fills each of the two monorails. The first two racks are stopped at exit end. Thereafter, each rack is stopped when its lever strikes the one before it and releases the ratchet from the conveyor dog.

Rack-stops are comprised of two pneumatic cylinders to which are attached an inclined plate. They are located directly above the racks and on the right side of the stop lever. To stop a rack, the pneumatic cylinders move the inclined plate horizontally and into line of travel of extended axle of the lever's forward roller.

When it strikes this plate, axle is elevated, depressing the ratchet and releasing it from the power conveyor.

When the operator wishes to remove a rack, he selects one from Conveyor 1 or 2 in the cooler and presses release button. This causes rack-stop to retract the inclined plate, and the rack automatically moves out of the cooler.

As it leaves the exit, the rack strikes two toggle switches. One automatically positions a switch so the rack may move into the single inclined monorail. The other recycles the rack-stop's pneumatic cylinders and re-positions the inclined plate in the travel line of the next rack.

Operator pushes empty racks into the next section of powered conveyor monorail. This section (118 ft. in length) forms adequate storage room and is completely isolated from any work area. It moves racks forward until they strike the rack-stop just preceding the Pan-O-Mat loading station.

Pans are unloaded and placed on a conveyor to move through the roll slicers. The band-knives are adjusted so they will clear the tops of the pans and slice rolls at their approximate centers.

There are two conveyors at this point. Pans of rolls move on a large one, while trays, made by the automatic roll tray machine, are conveyed on a smaller one. Removing rolls from pans and packing them in trays is a manual operation. Filled trays are conveyed to the wrapper, and finished product is packed on wire nesting trays and placed on the carriage monorail to be delivered to transport stations.

Bread Handling

Bread conveying from cooler to slicer-wrappers and to transportation stations shows a high degree of creative engineering.

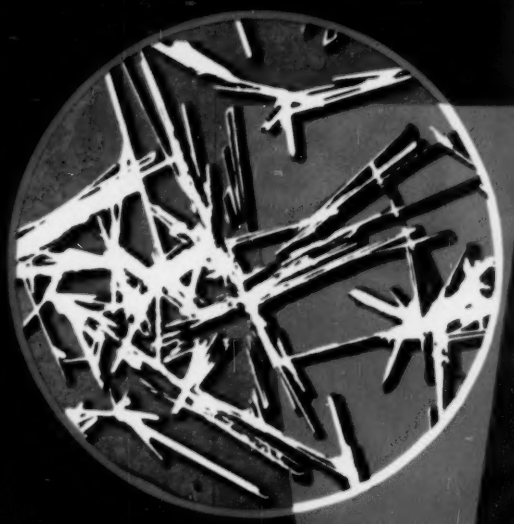
On the cooler discharge conveyor, bread may be diverted (by a push-button controlled selector unit) to the Wendway reservoir "merry-go-'round". Otherwise, it continues to the Selectier, an automatic boom-type conveyor that may be set on the control panel to supply any one, or all five, of the conveyors leading to the slicers.

The Jervis Webb Co. monorail bread and roll conveyor was engineered specifically for materials handling in this plant. It travels above machines and working areas except at loading and unloading points, where it drops to floor level. As carriages pass unloading points, checkers pick out orders. Returning carriages are loaded with empty wire trays.

There are sufficient carriages so that when checkers do not remove all the bread or rolls in them, they merely make another trip. Thus the monorail provides a storage or reservoir for finished product.

At each of the five wrapping stations, the operator transfers wrapped bread to wire trays. When one is filled, he merely lifts it from a stack and slides it into a passing carriage on the monorail. Relatively the same method is used by the operator loading rolls.

Route trucks are also equipped with angle-iron slides with interstices of a little more than the height of a loaf of bread. The wire trays, filled with product, are slid into the truck. When the salesman makes a



VITAMIN B_1 COMES RIGHT FROM ROCHE

Roche makes 'Roche' thiamine (vitamin B_1) "by the tons."

Mononitrate and hydrochloride types are always ready for all your needs—every quantity you will ever require—all the quality you will ever demand.

For nutritive supplements, food or cereal enrichment, as well as oral pharmaceutical preparations, the mononitrate or hydrochloride is instantly available; for injectable products our long-preferred ampul type hydrochloride is always ready for immediate shipment to pharmaceutical makers.

Roche proudly produces vitamin B_1 under careful, constant control . . . packed to reach you quickly from convenient shipping points . . . unharmed, untouched, unsurpassed.

Roche is the right one to help you manufacture fine B_1 pharmaceuticals that meet or exceed the most rigid U.S.P. specifications. If you manufacture or process foods, 'Roche' thiamine can help your products meet the highest standards, including Federal Definitions and Standards of Identity that exist for certain enriched foods.

ORDER right . . . ORDER from Roche

VITAMIN DIVISION

HOFFMANN-LA ROCHE INC.

NUTLEY 10, NEW JERSEY, NUTLEY 2-5000 • NEW YORK, OXFORD 5-1400

Illustration represents actual crystals under high magnification, using shadow technique

Why you should use 'ROCHE' THIAMINE

HYDROCHLORIDE AND MONONITRATE

(vitamin B_1)

Here are ten persuasive reasons why 'Roche' thiamine should be your choice for manufacturing purposes

1. **U. S. P.** Both 'Roche' thiamine hydrochloride and mononitrate equal or exceed U. S. P. specifications.

2. **TWO TYPES.** Roche has *two types* of thiamine hydrochloride available for you:

   Regular—*for tablets, capsules, dry and liquid nutritive supplements and multivitamin preparations.*

   Ampul—*specially prepared for use in manufacturing parenteral solutions.*

3. **SPECIAL PROBLEMS.** Roche has thiamine mononitrate to help you meet unusual stability problems which can occur in dry cereal or pharmaceutical products. Also it may have advantages in certain pharmaceutical products where the pH range is above the safe level for the hydrochloride.

4. **STEADY SUPPLY.** Because Roche makes *quality* thiamine by the tons, you can be sure of a steady, *quality* supply.

5. **RESEARCH.** Continuing world-wide research brings you the latest developments in vitamin knowledge.

6. **PRODUCTION CONTROL.** Scientific production control assures you of consistent, highest quality.

7. **QUICK DELIVERY.** Every order receives prompt careful service from convenient points. Transportation at lowest rate allowed and prepaid to destination. Special routings at cost. And you *know* you can count on our promises.

8. **PACKAGING.** Packed in polyethylene bags in ½ and 1-kilo tamper-pruf metal containers and in fibre drums up to 20 kilos for the hydrochloride, 35 kilos for the mononitrate. Small quantities in amber S.C. bottles. *Ampul type* thiamine hydrochloride is sealed under inert gas in 100 gram S.C. bottles and in ½ and 1-kilo tamper-pruf metal containers.

9. **KNOW-HOW.** Roche know-how on vitamins can help you with solutions to compounding and packaging problems.

10. **SAMPLES** and technical assistance are yours on request. Ask your Roche salesman or write the Vitamin Division.

Make a note now... **CALL ROCHE FOR VITAMINS**

Vitamin Division • HOFFMANN-LA ROCHE INC. • Nutley 10, New Jersey

NUtley 2-5000

Pacific Coast distributor: **L. H. BUTCHER COMPANY, San Francisco • Los Angeles • Seattle • Portland • Salt Lake City**

In Canada: **Hoffmann-La Roche Ltd., 286 St. Paul Street, West; Montreal, Quebec**

delivery, he can easily stack the empty trays on the floor of the truck, completely out of his working space.

Another mechanical feature in this new plant is the utensil handling and storage method, which eliminates the heavy racks formerly used for storing and the manual moving of pans about the bakery.

From the depanner, straps move by overhead, hooded, blower-ventilated conveyor to the exhaust fan-equipped pan-storage room. Here, they may be automatically switched to a continuous flow conveyor to travel directly to panners or to go to a storage conveyor.

Pans are removed from latter and stacked on inclined roller conveyors. Then stacks move by gravity to stops adjacent to the continuous flow conveyor, making loading from storage a simple, easy job.

BUILDING CONSTRUCTION

Most modern in bakery design, Langendorf's new building offers a number of valuable advantages. It has a concrete roof which, though only 4 in. thick, spans 52 ft. and provides 171-ft. long bays, unobstructed by supporting columns. The thin slabs forming the roof are prestressed. Yet cost-in-place was only about $1.50 per sq. ft.

The one-story plant has a total floor area of 127,500 sq. ft., of which 62,300 sq. ft. is roofed with this shell concrete. This space (365x171 ft.) is utilized for the bakery operation. The remainder is for storage, offices, garage, and utilities.

Four 8x8-ft. skylights, glazed with heat-resistant glass, are located in each of the horizontal plates in the interior bays, affording daylight illumination in the plant. All possible conduits were placed in the concrete shell roof to eliminate the need of attaching these to the ceiling.

In addition to its low cost, this type of structure is used because—

1. The roof is noncombustible—a point of major value in bakeries, where the presence of fire and the possibility of flour-dust accumulating presents a hazard. This structure presents unlimited area without the need for interior fire-wall separation.

2. It is sanitary—presenting no projections and few columns where dust may collect.

3. The large bays and minimum number of supporting columns permit easy arrangement of machines and equipment.

Bennett & Bennett, Pasadena, Calif., were the architects. H. J. Daum constructed the building.

End (Resume reading on page 50)

PROTECTION

all along the line

High heat and corrosion resistance. Exceptional strength and wear resistance. Straightness and concentricity with uniform wall thickness.

WALLINGFORD
Stainless Steel
COLD DRAWN
TUBING

In the sports field, the football quarterback is protected from the hard-charging enemy by his stalwart forward line. In the products field, the purity and flavor of food products is best protected by Wallingford Stainless Steel Cold Drawn Tubing in flow lines, coolers, pasteurizers, sterilizers, heat exchangers, evaporators, bottling machines and other food handling equipment.

Wallingford Stainless Steel Cold Drawn Tubing is furnished in analysis Types 304 — 304L — 316 — 316L with accepted sanitary polishing inside, outside, or both . . . or regular annealed and pickled.

Long-run economy is assured by low cleaning and maintenance costs, long life and uninterrupted service, and the elimination of product spoilage.

Write for free booklet,
"WALLINGFORD Quality Tubing and Pipe."

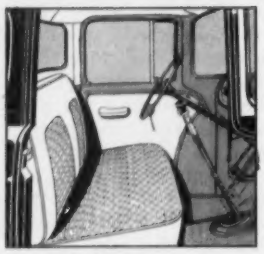
THE WALLINGFORD STEEL CO.
WALLINGFORD, CONN., U.S.A.

COLD ROLLED STRIP
Super Metals • Stainless
Alloy • High Carbon • Low Carbon

WELDED TUBES and PIPE
Super Metals • Stainless

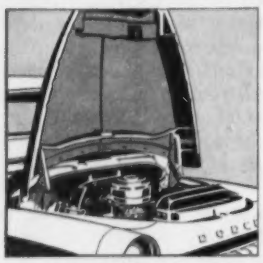
For more data, circle this page number on card at back →

FIRST NEW



NEW COMFORT CABS

Industry's largest, for real stretch-out comfort. All-new seat design permits adjustment of back cushion and seat height, plus normal slide positioning.



FULL-OPENING HOOD

Exclusive!—Can be raised full 90° for easiest, fastest engine servicing, half-way for routine oil and water checks.

Door-to-door delivery chassis

SHOWING

DODGE

PowerGiants

- **NEW giant-power V-8 engines!**
- **NEW push-button driving!**
- **NEW higher load capacities!**
- **NEW *Forward* Look Styling!**

Get set to profit from a great *new* kind of truck—with *more* V-8 power and *more* payload capacity—with *more* eager-to-go snap than any other make on the road!

From 204-hp. pick-ups to 232-hp. tandems, today's new low-priced V-8 Dodge *Power Giants* deliver more truck per dollar—and more profitable payloads—in *every* weight class, 4,250 lbs. G.V.W. to 65,000 lbs. G.C.W.

New short-stroke Chrysler-engineered V-8's—with exclusive Power-Dome combustion—give you more miles per gallon, full power on *regular* gas. Increased power in famous, dependable Dodge 6's, too.

Push-button automatic transmission is still another great plus you get only in new Dodge *Power Giants.** First in any truck! Simple, sure, trouble-free. Just push a button, shifting is automatic.

Test-drive a Power Giant—V-8 or 6—soon! Get your Dodge dealer's deal *before* you decide on your new truck.

**Available on low-tonnage and forward-control models.*

DODGE TRUCKS

WITH THE *FORWARD* LOOK

Panel models

Tractor models up to 65,000 lbs. G.C.W.

Cab and Chassis models

4 pick-up models up to 8,800 lbs. G.V.W.

For more data, circle this page number on card at back →

THEY LOOK SO GOOD . . . the wonder is that any housewife can long resist the tempting food products displayed in today's exciting consumer advertising. Truth to tell, not many of them do . . . and so, this pictured promise of mouth-watering satisfaction *has to be fulfilled*. Ready to help the manufacturer meet this obligation is the supplier whose flavors ultimately determine the taste-character and quality of the finished goods. In choosing such supplier, remember that reputation, reliability and experience are your safest guides. Remember, too: *Your product is* ONLY *as good as its* FLAVOR!

If interested in special flavor applications – pie or cake filling, dessert powder, food or beverage – write our Flavor Division, Dept. FE.

FRITZSCHE *Established* 1871

Brothers, Inc.

PORT AUTHORITY BUILDING, 76 NINTH AVENUE, NEW YORK 11, N. Y.

BRANCH OFFICES *and* *STOCKS: *Atlanta, Georgia, Boston, Massachusetts, *Chicago, Illinois, Cincinnati, Ohio, *Los Angeles, California, Philadelphia, Pennsylvania, San Francisco, California, St. Louis, Missouri, Montreal and *Toronto, Canada and *Mexico, D. F. FACTORY: Clifton, N. J.

QUESTIONS & ANSWERS

THIS MONTH'S PROBLEM

Making Pizzas

Question—Our bakery is planning to make pizza pies. But we need better formulas than those now being used for preparing the dough and various fillings. Can you come to our aid?

SEPTEMBER PROBLEM

Bags Break, Lose Product

The Question Was—We're packing a granular, free-flowing product in a bag within a carton. But we're running into complaints. Some of the bags break and product sifts out of the carton. Can you trace the source of our trouble?

Answer—We believe that your difficulty is in the manner the bags are inserted in the carton. Most likely the bag gussets are not being supported by the sides of the carton.

As a result, dropping or rough handling of the shipping containers tends to make the powder flow and, through "hydraulic-ram action," bag seams are split.

Only suggestion we can offer is to make certain that the sides of the carton fully support the bag gussets.

Preparing Tamale Pies

Question—Would your editorial staff have several formulas for the manufacture of tamale pies?

Answer—Here are two formulas you can work out on a test basis:

Tamale Pie Formula No. 1.

Fine hominy grits	9⅜ lb.
Water	56 lb.
Salt	7 oz.
Shortening	14 oz.
Chili powder	⅞ oz.

Tamale Pie Formula No. 2.

Commercial-type breading	7½ oz.
Water	2½ lb.
Evaporated milk	3½ lb.
Onions (finely chopped)	¾ lb.
Shortening (melted)	¼ lb.
Ground beef (lean)	3 lb.
Tomatoes (canned)	1¼ lb.
Breading	1½ oz.
Chili powder	½ oz.
Salt	¼ oz.
Pepper	⅛ oz.

Now to make a tamale pie, using the No. 2 formula as an example:

Add the 7½ oz. of breading in a kettle and, introduce with stirring, the water and milk. Cook until batch thickens, remove from heat, cover kettle, and set it aside.

Slowly cook onions in hot, melted shortening for 5 min. Add meat, and continue cooking until it has lost its red color. Sprinkle 1½ oz. of breading and seasoning into mixture, and thoroughly mix. Introduce tomatoes and continue cooking until well blended into batch.

Line bottom of greased foil pans with half-cooked breading mixture. Pour into meat mixture, and evenly spread rest of cooled breading mixture over top of pie. Bake 45 min. at 350F.

New Fluorescent Lamp

Question—Do you have any information on a new fluorescent lamp that's supposed to be cheaper and give more light?

Answer—Wonder if you're thinking of the new G-E "Power Groove" fluorescent lamp that was announced last spring?

We don't know if it's cheaper than others. But it is supposed to save about 20% in initial cost when compared with G-E's High Output lamp.

It does give more light—twice as much (some 25w. per ft.) as the best of previous fluorescents.

Its higher light output stems from a radical change in tube design. There's a series of lengthwise grooves along one side. And, with the exception of bridges connecting the grooves, it is U-shaped in cross section. Reason for this shape is to

HOW TO DO IT?

Readers are invited to submit to FOOD ENGINEERING answers to question, "This Month's Problem." Selected answers will be published with credit (unless you specify otherwise). We pay space rates.

JUST ASK US

Subscribers also are invited to send in food engineering questions. We undertake to provide answers, free, to the best of our ability. We do not undertake costly investigations. Give full information and your name. Your identity will not be disclosed.

Write to Questions & Answers Editor, FOOD ENGINEERING, 330 W. 42nd St., New York 36, N. Y.

℞

for broken floor joints

Don't take chances with sanitary standards and operating efficiency. At the first sign of joint breakdown take corrective action by regrouting with Drehmann Joint Filler.

This grouting material is a product of Drehmann research—developed by the pioneer and leader of brick floor installation to meet the exacting requirements of the food processing industry.

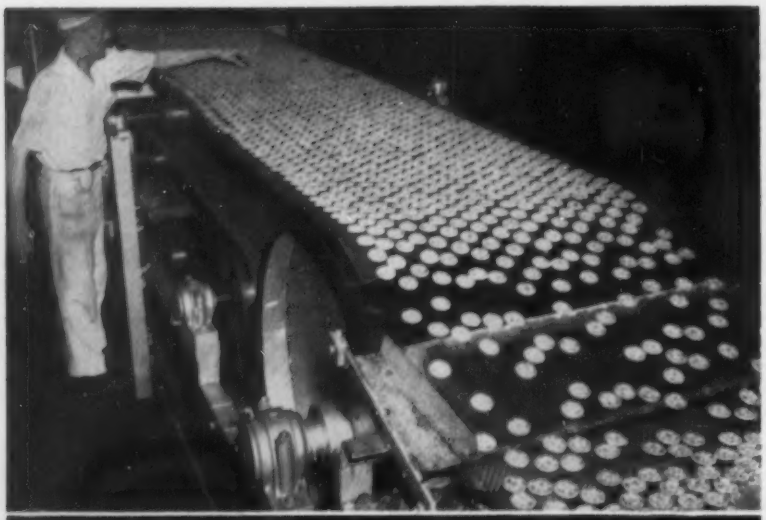
Drehmann Joint Filler is harder and denser. It is fast setting and highly resistant to acids, alkalies and other food plant corrosives.

Drehmann Joint Filler comes in 100 and 200 pound drums. To facilitate quick accurate mixing a graduated measuring pail is provided (without extra cost) with every batch.

Write for Bulletin JF

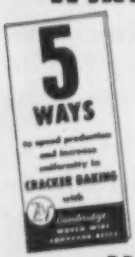
DREHMANN
Joint filler

DREHMANN PAVING & FLOORING CO.
Originator of Brick Floors • Est. 1869
Gaul & Tioga Streets, Philadelphia 34, Pa.
507 Fifth Avenue, New York 17, New York



FEWER BURNED CRACKERS

WITH *Cambridge*
WIRE MESH CONVEYOR BELTS



Regardless of what you're baking, you'll get a more uniform product by seasoning, baking, cooling, packaging at controlled speed on continuously moving wire mesh belts. Open mesh provides uniform heat distribution and free circulation for cooling . . . eliminates sticking. Write for detailed discussion of how Cambridge Wire Mesh Conveyor Belts can speed production by minimizing manual handling.

No matter what food or process . . .

. . . canning, freezing, baking . . . meat, poultry, candy, fruit or produce . . . Cambridge Wire Mesh Conveyor Belts can reduce your operating costs and increase product quality by continuous uniform processing with reduced manual handling. Lifelong rust-protection, quick drainage of process solutions, lack of odor and freedom from contamination are only a few advantages. All-metal belt is impervious to damage from heat and cold. There are no sharp edges because Cambridge belts are woven from round wire.

Cambridge Wire Mesh Conveyor Belts are made in any size, mesh or weave, and from any metal or alloy. Special raised edges or cross-mounted flights to hold your product during movement are available.

Call in your Cambridge Field Engineer to discuss how you can cut food processing costs by continuous operation. You can rely on his advice. Write direct or look under "BELTING, Mechanical" in your classified telephone book.

ASK FOR FREE 130-PAGE REFERENCE MANUAL illustrating and describing wire mesh conveyor belts. Gives mesh specifications, design information and metallurgical data. Ask for Special Industry Folder on your operation.

The Cambridge Wire Cloth Co.

WIRE CLOTH | METAL CONVEYOR BELTS | SPECIAL METAL FABRICATIONS

DEPARTMENT Q, CAMBRIDGE 11, MARYLAND

OFFICES IN PRINCIPAL INDUSTRIAL CITIES

provide maximum outside area without constricting the volume of the tube.

This lamp may set up new illumination standards in plants.

Labels Mar

Question—Recently, we stepped up the speed of our preserve filling so that it became economical to install an automatic case packer. We were very pleased with the labor savings, until it was discovered that many jar labels showed an unsightly nick on the lower edge. We have not encountered this trouble on any other case packer, and have been unable to correct it. Can you offer any suggestions?

Answer—Evidently, contact of the label with the top edge of the "crate" of the case packer is catching and marring the labels. Friction at this point of contact should be reduced to a minimum.

One method would be to chromium plate and polish the crate. Another would be to Teflon coat it or have a nylon-fabricated crate.

Since you mention that you have not had this difficulty with any other case packer, it suggests that the trouble may not be solely mechanical. Seems like some factor related to the product line itself may be involved. It also seems likely in this case, that the labels may still be moist and, therefore, soft at the moment they rub across the crate into dropping position.

This condition is apt to arise in water-cooled glass jars that are not thoroughly dried by the time labels are applied. In this case, the excess moisture could very well be the real cause of your marring.

We, therefore, recommend that you check jar drying and, if necessary, improve it by introducing compressed air jets to remove adhering water drops. Or you could use infrared lamps to evaporate surface moisture. In using lamps, they could perhaps best be mounted after the labeller so as to dry the paper stock.

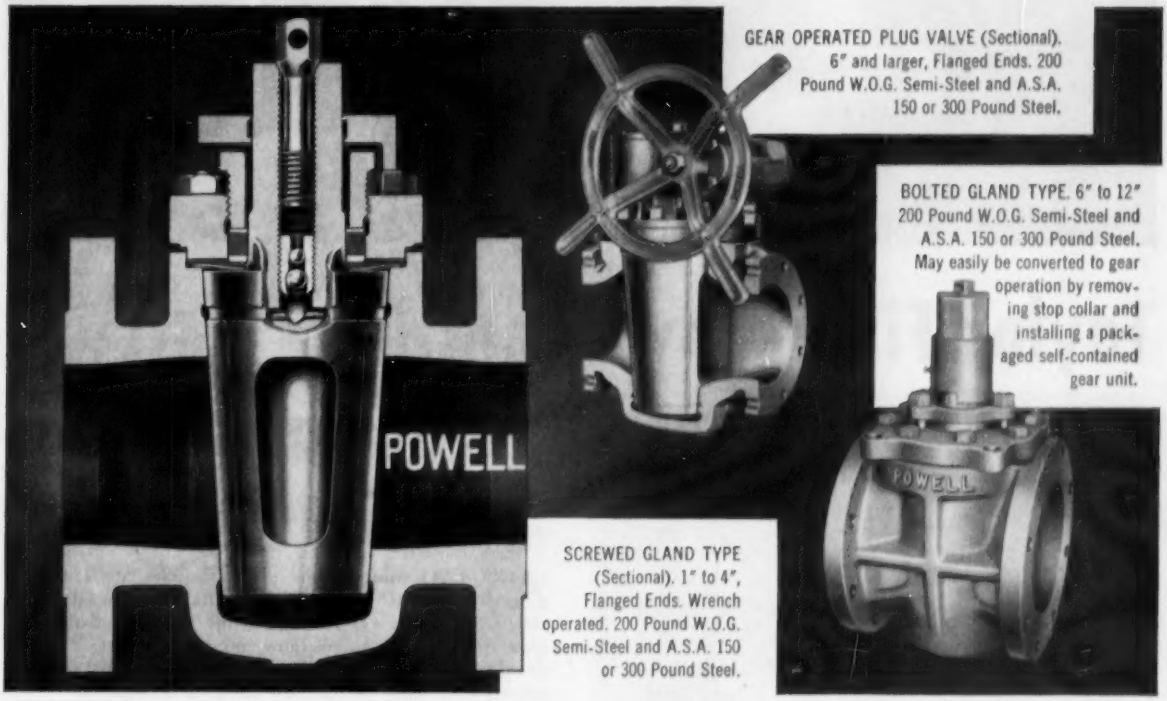
One final suggestion. In case all of the above suggestions do not completely solve your problem, then try using slightly heavier label paper.

Q.—What's a good filling for ravioli that's to be packaged and frozen?

A.—Blend: Ground Beef, 3½ lb.; Paramesan cheese (grated), 7½ oz.; eggs (beaten), 1⅛ lb.; parsley (minced), ¼ oz.; lemon peel (grated), ½ oz.; butter, ½ lb.; salt and pepper to suit.

POWELL

Lubricated Plug VALVES



GEAR OPERATED PLUG VALVE (Sectional). 6" and larger, Flanged Ends. 200 Pound W.O.G. Semi-Steel and A.S.A. 150 or 300 Pound Steel.

BOLTED GLAND TYPE. 6" to 12" 200 Pound W.O.G. Semi-Steel and A.S.A. 150 or 300 Pound Steel. May easily be converted to gear operation by removing stop collar and installing a packaged self-contained gear unit.

SCREWED GLAND TYPE (Sectional). 1" to 4", Flanged Ends. Wrench operated. 200 Pound W.O.G. Semi-Steel and A.S.A. 150 or 300 Pound Steel.

Powell Lubricated Plug Valves maintain our 110-year tradition of quality and precision. Only the finest available materials are used. And painstaking quality control is rigidly enforced through each and every step of manufacture.

Features include quick and positive operation—just a quarter-turn to open or close. Lubricant grooves surrounding each port provide a positive seal when the valve is closed. In an open position, seating surfaces are not exposed.

Valve users who want one source of supply for lubricated plug as well as all types of bronze, iron, steel and corrosion-resistant valves will want full details on Powell Lubricated Plug Valves.

Available in Steel and Semi-Steel through distributors in principal cities. If none is located near you—or if you need help on valve problems—write direct to

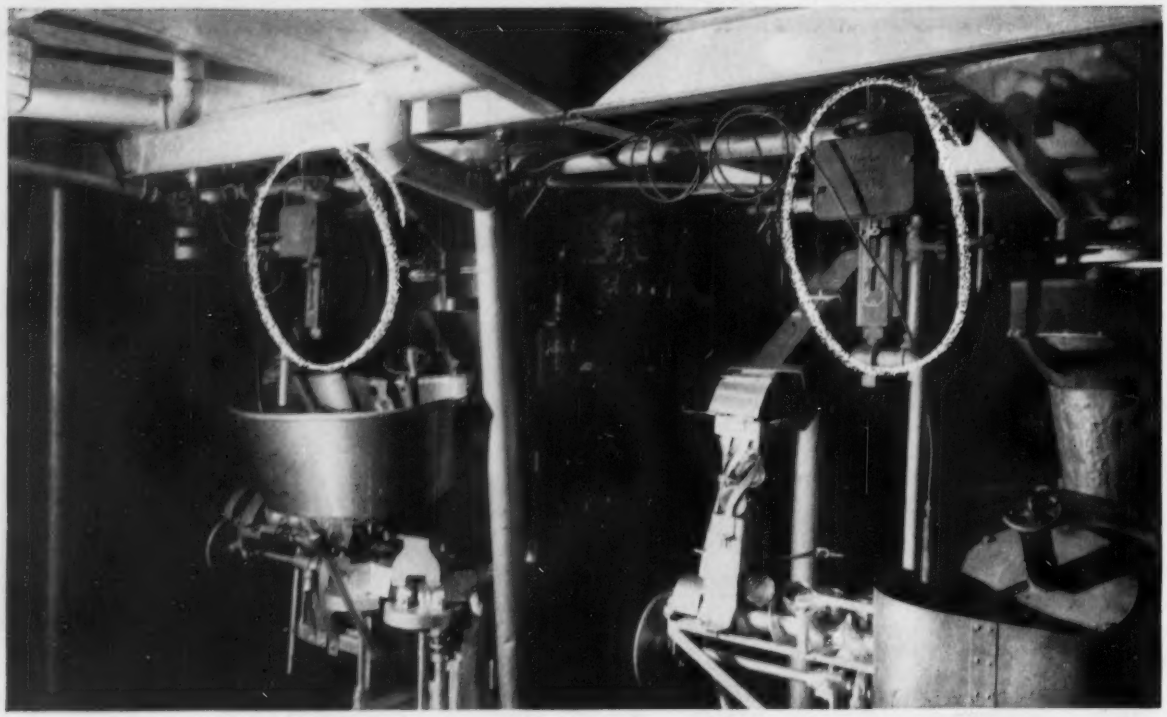
PERFORMANCE PV VERIFIED

BRONZE, IRON, STEEL AND CORROSION-RESISTANT VALVES

The Wm. Powell Company, Cincinnati 22, Ohio . . . 110th YEAR

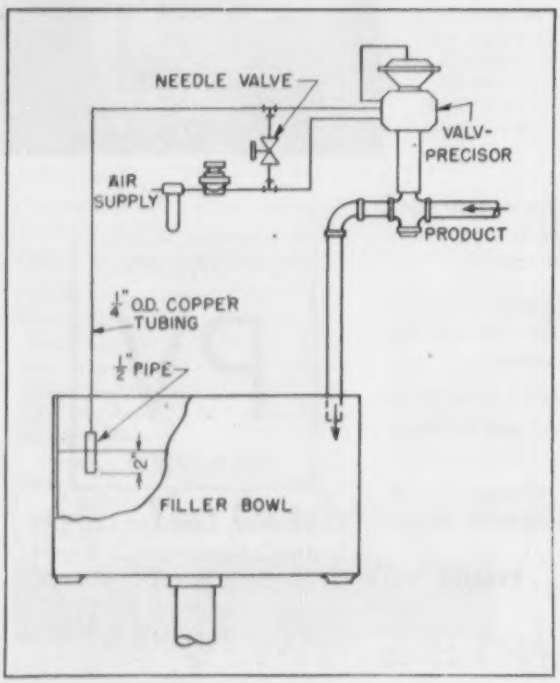
The source of supply for all valve needs!

For more data, circle this page number on card at back →



Taylor Filler Bowl Control produces substantial savings

for Libby, McNeill & Libby



ACCURATE control of the level in the filler bowls of the 10 closing machines at their Walla Walla, Washington, pea packing plant was achieved by the Taylor control system illustrated. Result—no overflow, no waste, no time lost in cleaning up the mess. In addition this Taylor control system is entirely automatic—no operator attention is required.

Filler bowl level is sensed by a simple air bubble system, the back pressure of which goes to a VALV-PRECISOR* Positioner which in turn operates the diaphragm valve in the product line. Alternative systems can be float actuated, or a 3-way sanitary valve can be used to divert the surplus back to the supply.

Preventing waste and saving operator time are just a couple of the ways Taylor instrumentation contributes to processing efficiency in the canning industry. It's very possible that automatic control can save you money too. Why not consult your Taylor Field Engineer, or write for the **new Catalog 500.**

Taylor Instrument Companies, Rochester, N. Y., or Toronto, Canada.

*Reg. U.S. Pat. Off.

Taylor Instruments
MEAN ACCURACY FIRST

The added cost would still be much less than the labor you are saving with the case packer over manual casing.

And don't forget. These little imperfections in appearance, of no real consequence as far as the value and quality of your product are concerned, deserve special consideration if your product is being sold in self-service stores. They may be just the margin between the consumer reaching for your brand, or for a competitor's!

Chorizo Sausage

Question—How can we go about making a dried highly spiced Spanish-type sausage which is known as Chorizo?

Answer—Here's a formula:

Special lean pork trimmings	33	lb.
Neck bone trimmings	33	lb.
Fat pork trimmings	34	lb.
Salt	3	lb.
Sodium nitrate	2	oz.
Sodium nitrate	¼	oz.
Sugar	6	oz.
Garlic powder	¼	oz.
Ground sweet red pepper pods	8	oz.
Chili powder	6	oz.
Ground hot red pepper pods	4	oz.

Now to the process:

Grind pork trimmings through a ¼- or ⅜-in. plate. If beef is used, run it through a ⅛-in. plate. Introduce ground meats into mixer, and add ½ pt. of white wine vinegar along with the salt, spices, sugar, and cure.

Cure meat emulsion overnight in 38-F. cooler. Then stuff into cellulose casings of 30/32 size or larger, and link into 4-in. lengths. Hang linked sausages on smokesticks to dry. (It can be sold fresh at this point.)

Now hang sausages in dry room (54-58 F.) for 10 days. Then give them a light cool smoke. Bank them for 24-36 hr. in a dry room (54-58 F.). Finally, spread to dry for 14-21 days.—*Formula by The Visking Corp., Chicago.*

Q.—Do you have any idea how we might pack one of our products into a water-soluble film so that the entire package could be tossed into water and dissolved to release the product?

A.—You might look into the possibility of "capsulating" your product into a film made of sodium carboxymethylcellulose, plasticized with glycerine and 70% sorbitol solution.

LOW-COST PRODUCT PROTECTION

For over forty-five years **NULOMOLINE**®—the *pioneer* invert sugar—has been used as a "BALANCING" ingredient by Bakers, Candymakers, Syrup Processors, Fruit Preservers . . . in frozen foods, desserts, icings, toppings, spreads, and other food preparations.

NULOMOLINE is hygroscopic . . . attracts, retains, and equalizes distribution of moisture . . . retards crystallization . . . increases osmotic pressure . . . stabilizes density of syrup portion . . . resists fermentation . . . controls texture and consistence . . . promotes product uniformity . . . improves taste and appearance.

USE NULOMOLINE . . . THE LOW-COST HYGROSCOPIC-HUMECTANT . . .

Packed in large and small containers—
in tank wagons and tank cars.

ORDER DIRECT OR THROUGH YOUR JOBBER.

Write, phone, or call and discuss your problems in confidence with **NULOMOLINE SERVICE.** Our technical and practical staffs are *at your service!*

THE NULOMOLINE DIVISION
AMERICAN MOLASSES COMPANY

Manufacturers of NULOMOLINE *(Standardized Invert Sugar) and Syrups*

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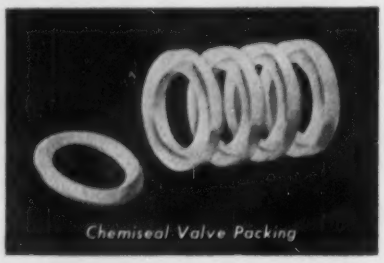
CHEMISEAL
MECHANICAL SEAL

specialists . . .

IN FOOD PLANT PACKINGS AND GASKETS

Chemiseal Packings and Gaskets were designed by specialists for corrosion, contamination and sanitation problems in the food and chemical industries.

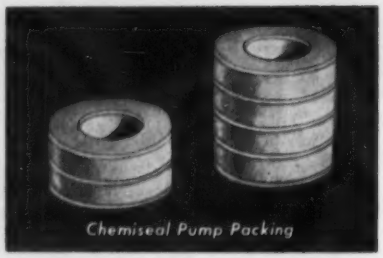
Designed of chemically inert TEFLON, du Pont's wonder plastic that laughs at food acids, alkalis, solvents—that withstands sterilizing temperatures—that has zero water absorption—that is extremely anti-hesive—Chemiseal Packing and Gaskets are fast replacing other types throughout the food industry.



Chemiseal Valve Packing

CHEMISEAL MECHANICAL SEAL. An "all-TEFLON" Seal of pressure-balanced bellows design. Good for all mediums including fluids with suspended solids. Applicable to all pump or agitator shafts. Catalog No. MS-1155.

CHEMISEAL V-TYPE PACKING is the ideal valve packing that seals with low gland pressures and operating torque. Extremely resilient, tough and anti-hesive—it will not seize the valve stem or shaft even when handling the most difficult solutions. Supplied in sets with square end adapters. Catalog No. TP-1255.



Chemiseal Pump Packing

CHEMISEAL PUMP PACKING is extremely effective for rotating and reciprocating shafts. Provides a low friction 2-way seal that not only prevents axial seepage, but also seals against shaft and stuffing box as well. Supplied in sets to meet specific requirements. Catalog No. TP-1255.

Chemiseal Teflon-jacketed Gaskets

CHEMISEAL TEFLON-JACKETED GASKETS are available in any size, with a variety of filler materials suitable for glass, glass-lined, porcelain-lined and metal piping equipment. These fillers are protected on both faces and the inside diameter by the inert TEFLON Jacket. Catalog No. TG-953.

Made of du Pont
TEFLON

Ask your U.S. Gasket—Belmont Packing Distributor or write.

UNITED STATES GASKET CO.
Camden 1, New Jersey

U G BELMONT

U.S. GASKET • BELMONT PACKING

Stabilized Caramel Formula

Question—Do you know how I can get directions for making stabilized caramel using an Irish moss extract?

Answer—Add to a cooking kettle equipped with scrapers:

Corn syrup	30 lb.
Sugar	14⅛ lb.
Boontex fat*	5 lb.
Butter flavor	2½ oz.
Sweetened condensed whole milk	25 lb.
Salt	3 oz.
Ammonium carbonate solution**	2½ oz.
Lecithin	1½ oz.

* Standard vegetable shortening for baking and frying, E. F. Drew & Co.

** 1½ lb. ammonium carbonate per gallon water.

In a separate kettle, prepare a dry blend of 10 oz. of sugar and 1.025 oz. of SK. 14 (Sea Kem Irish Moss extractive). Add dry blend to 2½ lb. of water (160-180 F.). Now introduce SK. 14-sugar solution to main batch toward end of cook. Finally cook to about 240F., add 1.7 oz. of vanilla flavor, slab, and cool.—*Justin J. Alikonis, Al-Chem Laboratory, Inc., Bloomington, Ill.*

Washroom Fixtures

Question—We are in the process of constructing a new plant. Our engineer and production manager, with the cooperation of equipment manufacturers, have come up with excellent processing facilities that will be well laid out. But one thing we have overlooked—our washroom facilities. What we'd like to know are number and type of fixtures needed and cleaning procedures. What suggestions might you offer?

Answer—First, you'll have to check over your city building codes to see whether or not they indicate the number of fixtures needed. If they don't, then figure on one fixture combination for every 10 employees. Install two urinals for each toilet. And plan on putting in a washbasin for every 20 employees.

Now to some suggestions on fixtures: The wall-hung, off-the-floor urinal that results in a neater, easier-to-mop-up washroom is generally specified. However, the new sanitary straddle-type urinal, with bowl that is not touched, is becoming increasingly popular.

As to toilets. Here, too, wall-hung, off-the-floor fixtures are best.

Morton Salt Company's new million dollar laboratory at Woodstock, Illinois, is at the service of the Food Industry to help solve problems relating to the use of salt. For example, here's . . .

How Morton helped pickle packers make a better product

Here's a pickle packer following the Morton procedure for determining the acid and salt content in a pickle brine sample.

Salting pickles correctly—to produce uniform high quality—presents two major problems to pickle packers.

1 Pickle packers (like other canners and food packers) have the problem of using the right amount of salt. The Morton Salt Company helped solve this problem by developing a procedure for testing pickles for *both* acid and salt content.

Morton's testing procedure is fast, accurate, and relatively simple. It includes a glass stirring rod with end point testing colors and contains complete data on when and how to test for acid and salt content.

2 Pickle packers also face the problem of using the right type of salt for better flavor control. Morton helped solve this problem with Morton '999' Salt.

How Morton can help you make a better product

Chances are Morton can help you turn out a better product for less money if you use salt for canning, packing or processing any food product. For Morton makes many grades of salt for the Food Industry, and only Morton has 9 strategically located plants to serve you. We offer fast delivery from a bag to a trainload at favorable prices and freight, *anywhere* in the country.

What's more, one of Morton's Food Technologists can assist you with on-the-spot help with any problem you have pertaining to salt. And he's backed by the services of chemists and salt scientists at Morton's ultra-modern research laboratory.

'999' is a high purity, low cost salt which contains 99.9% clean, pure sodium chloride; exceptionally low in the objectionable trace metals, copper and iron. '999' is an evaporated granulated salt that won't break up in shipment and will dissolve uniformly in an average time of about six minutes (not too fast or too slow). Morton '999' Salt has a practically constant weight per volume and is easily and efficiently dispensed by hand or machine.

☐ Please send me your free testing procedure for determining the acid and salt content of pickle brine.*

☐ I am not a pickle packer but would like more information on how Morton can help me_____

_____

Name_____

Title_____

Company_____

Street_____

City_____ Zone_____ State_____

*Glassware and chemicals necessary for testing pickle salt content may be obtained at a nominal fee from the Nat'l. Pickle Packers Assn.

MORTON SALT COMPANY
INDUSTRIAL DIVISION
Dept. FE-11, 120 So. La Salle Street, Chicago 3, Illinois

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YOUR CONTROL PROBLEM?

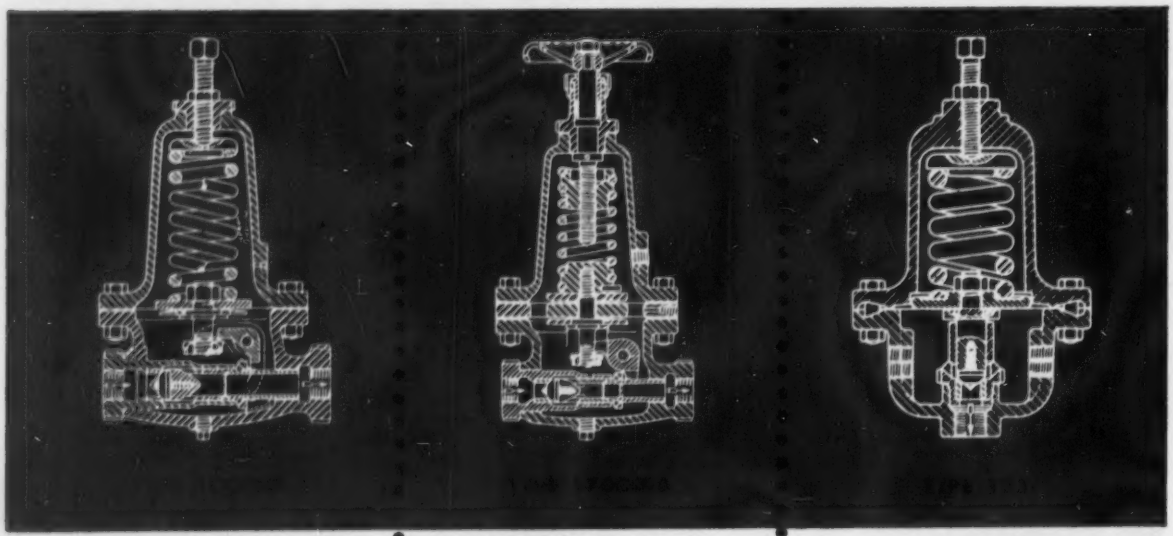
You'll find the Answer in

CASH STANDARD

Steam . . . Water
Air . . . Gas . . . Oil

REGULATORS FOR POWER

☑ GENERATION
☑ DISTRIBUTION



PRESSURE REDUCING VALVE

A streamlined high capacity valve for close pressure regulation—accurate even under toughest working conditions. Closes against the flow, eliminating conditions that cause chatter. Two types available: for high pressures and for low pressures. Recommended for steam, water, air, oil and most gases and chemicals. Screwed ends, sizes: ¼" to 2".

DIFFERENTIAL CONTROL VALVE

Maintains constant differential pressure between atomizing steam and fuel oil. Non-rising type adjusting screw adjusts spring either under tension or compression for maintaining steam above or below fuel oil pressure, depending on type of burner employed. Iron, bronze or steel body; bronze or stainless steel trim. Screwed ends, sizes ¼" to 2" with expanded outlets when desired.

RELIEF VALVE

Maintains a desired inlet pressure by relieving into relief line provided or protects equipment against high pressure line surges. For water, oils, air, gases, slurries and many other fluids. Bottom connection is outlet or discharge connection. Two side inlet connections permit installation in the line or as an angle valve with one side inlet plugged. For relief pressures to 325 lbs. and temperatures to 500° F. Screwed ends, sizes: ¼" to 2"; flanged ends, size ½".

Cash Standard
Stacon Series V Self Operating Temperature Regulators

Type 57
Recording Controllers

Type 30
Diaphragm Control Valve With Type 51 Indicating Controller Mounted

Type 44
Pilot Operated Pressure Regulator

Type 100
Positioning Controller

Contact the Cash Standard control specialist in your area or write Dept. G

CASH CS **STANDARD**

A. W. Cash Co. and Its Subsidiary, Cash Standard Stacon Corp.
P. O. Box 551, Decatur, Ill.

PRESSURE, HYDRAULIC, TEMPERATURE, PROCESS AND COMBUSTION CONTROLS

Bowls should be elongated and have black (preferably), sanitary-type, open-front seats. Install flush valves high on the wall to discourage kicking, or even better, put in floor-mounted, foot-operated buttons.

Recommended for wash basins are vitreous china or porcelain-enameled cast iron. China maintains its gleaming beauty longer, and it is easier to clean and keep clean. Enamel-finished cast iron wash basins are of heavy, durable construction.

There is an advantage in the faucets that automatically close with water pressure. They thus minimize leaking and dripping. But most employees tend to gripe about hard-to-use self-closing faucets.

Q.—Do you have a formula and directions for making corn muffins?

A.—Cream for 5 min.: Sugar, 9 lb.; invert sugar, 2 lb.; butter and shortening mixture, 5½ lb. Add slowly, while creaming, 4 lb. of eggs. To this add alternately and mix to a smooth batter: Bread flour, 16 lb.; baking powder, 1 lb.; corn meal (fine), 4 lb.; corn meal (coarse), 4 lb.; and milk, 20 lb. Add batter to greased cups, bake at 400F.

Single spouts are good because water at the desired temperature comes from one outlet. The ideal is a foot-operated valve that gives tempered water at the touch of a toe. And foot pedals fold out of the way while the floor is being cleaned up.

And provide these features: Partitioned closet stalls with doors for privacy, liquid or powdered soap dispensers, dispensers and wastepaper baskets for paper towels, large and well-illuminated mirrors, ash trays or sand buckets.

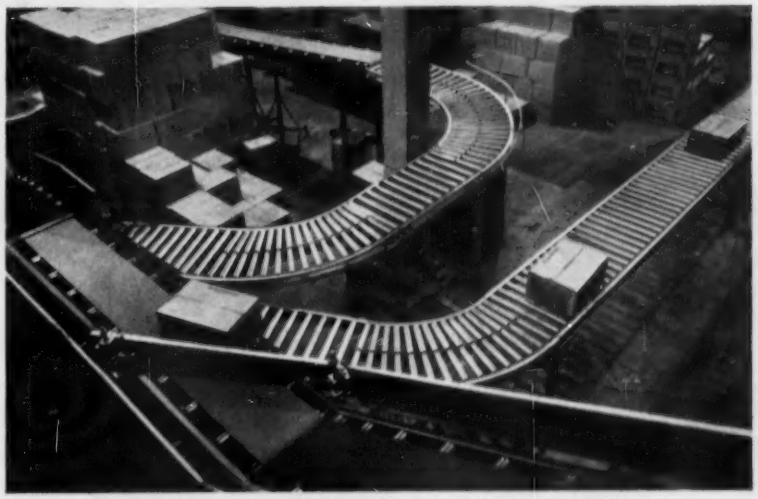
Put lounging chairs and well-illuminated vanity or dressing table in the woman's washroom.

Now to a cleaning schedule:

1. Clean inside of toilet by mixing detergent with water in bowl. Let mixture stand awhile, then swab with brush.
2. Add uric acid solvent (to get rid of odors) in urinals.
3. Use cleansing powder to clean outside of all fixtures.
4. Mop floor.
5. Empty waste receptacles and ash trays.
6. Polish mirrors and windows.
7. Check supplies like soap, paper towels, toilet tissue, etc.

Re-check the floors (for sweeping), waste receptacles, and supplies during the day, especially during and after periods of heavy traffic.—*Information by Crane Co., Chicago.*

Ask Standard ... how to cut costs with conveyors



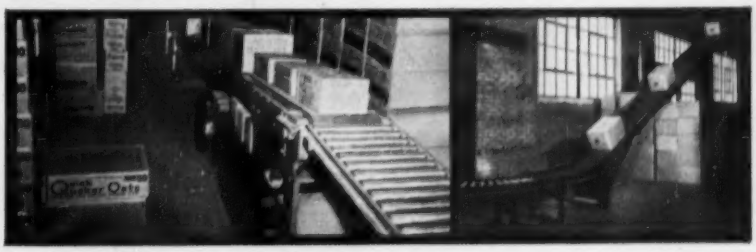
Order picking is expedited and simplified by this Standard system of roller and belt conveyors in large warehouse.

Roller and belt conveyors ease warehouse traffic jams

FAST flow of goods and simplified labor add up to more profitable warehouse operations.

Standard offers a wide variety of gravity and powered, permanent and portable conveyors — that can help you establish smooth, more profitable warehousing.

Spend a few moments with a Standard engineer. He'll show you how inexpensive Standard conveyors give you maximum flexibility at minimum cost. He'll show you, too, how Standard conveyors provide the many advantages of a custom-designed system at low cost. For the name of your nearby Standard engineer write STANDARD CONVEYOR COMPANY, General Offices: North St. Paul 9, Minn. Sales and Service in Principal Cities.



(LEFT) Belt-booster in a gravity roller conveyor "order picking" line. (RIGHT) Lift or lower floor-to-floor with an INCLINEBELT. Available in a wide range of heights and belt widths.

Write for Bulletin 309. Address Dept. D-11 or contact the Standard engineer listed in your classified phone book.

Standard 50 years of conveyor experience
GRAVITY & POWER CONVEYORS

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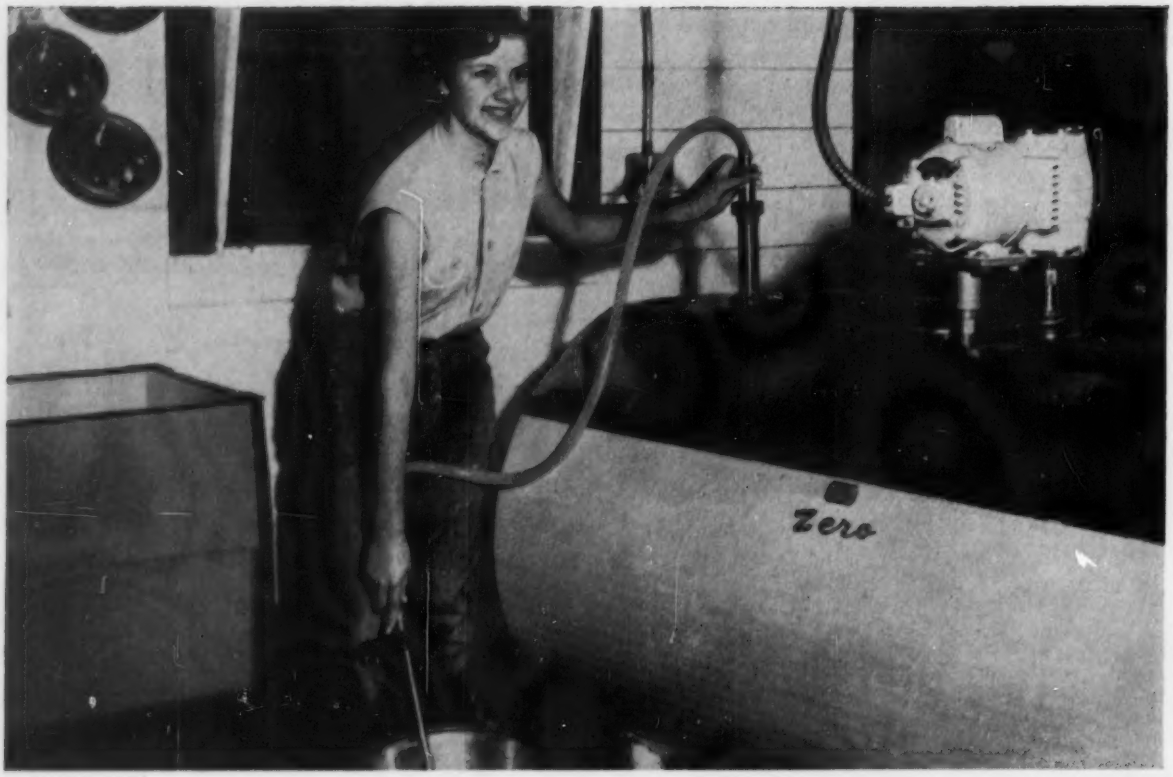


To guard against oil contamination on a shaft-down agitator application

NEW MILK COOLERS DEPEND ON Century Performance-Rated® GEARMOTORS

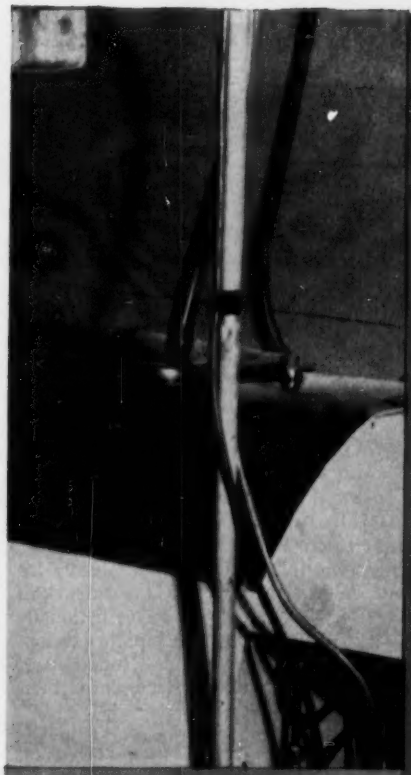
Century Performance-Rated Gearmotors are playing an important part in making possible this new era in milk handling. Slow agitation is important to chill the milk quickly and evenly in the cooler. Ordinary agitator motors mounted shaft-down, dripped oil into the milk. Century's unusually reliable standard shaft seal has virtually eliminated this problem.

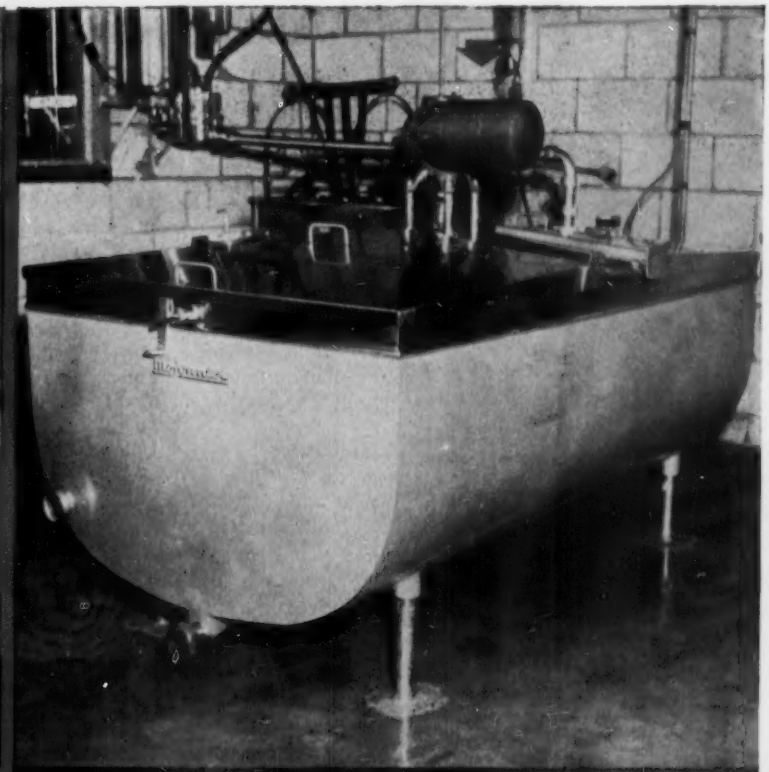
Furthermore, a motor must be "washable" if it is to be used in the sanitary milkhouse. Century can supply a pedestal-mounted gearmotor with a specially designed smooth-contour cover. This cover eliminates most crevices in which dirt could collect, and it protects the motor from moisture . . . even when it's washed down.

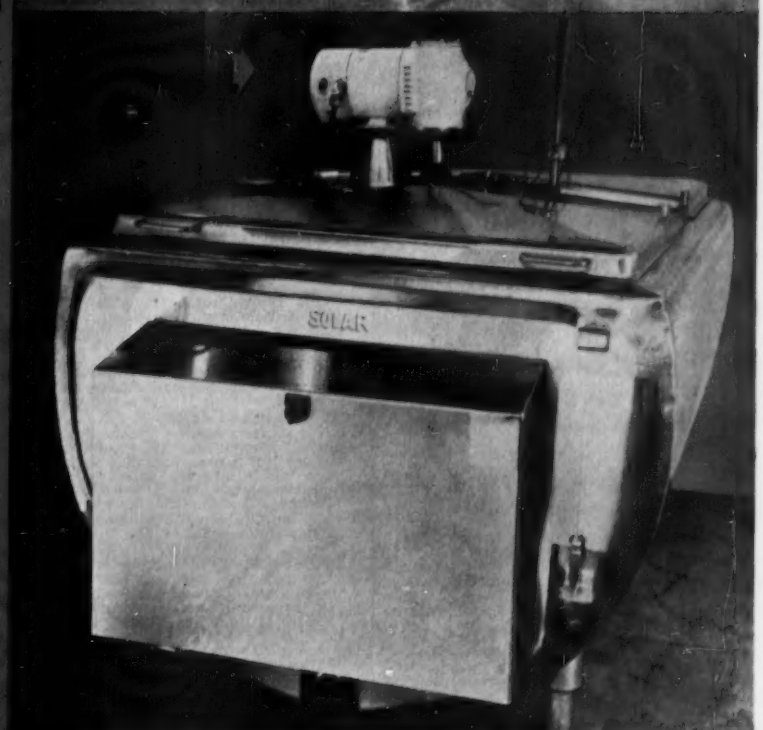
Could your processing operation be improved by Century Motors, Performance-Rated to give you the correct speed, protection and freedom from contamination? We will be happy to discuss your problems with you.

For full data call your nearest Century Sales Office or Authorized Distributor.

48







NEW PROFIT AND EFFICIENCY in milk handling is made possible for even small and medium-sized dairymen using these ingenious new bulk milk coolers. By drawing the fresh milk directly into the cooling tank for storage, bacteria counts are kept at a minimum, butterfat content is preserved. Leading manufacturers of these popular new milk coolers equip them with Century Gearmotors.

Performance Rated©
MOTORS
1/20 to 400 H.P.

C

CENTURY ELECTRIC COMPANY

1806 Pine Street • St. Louis 3, Missouri • *Offices and Stock Points in Principal Cities*

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is FOAM your production BOTTLENECK?

use a Dow Corning silicone defoamer

most efficient, versatile and economical foam-killers known!

one ounce of

ANTIFOAM A — KILLS FOAM IN **35,000 lb.** vitamin B_2

ANTIFOAM AF EMULSION — KILLS FOAM IN **250,000 lb.** molasses

Break that bottleneck . . . speed processing . . . boost productive capacity . . . eliminate waste and fire hazard of boil-overs. Use a Dow Corning silicone defoamer!

It is now permissible to use Antifoam A Compound in processing nonstandardized foods at concentrations up to 10 ppm—water dilutable Antifoam AF Emulsion at concentrations up to 34 ppm.

***Free Sample**—make your own test—send coupon today*

DOW CORNING SILICONES

Dow Corning Corporation
Midland, Mich. Dept. 5511

Please send me:
FREE sample of ☐ Antifoam A Compound; or ☐ Antifoam AF Emulsion;
☐ Booklet on Silicone Defoamers.

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COMPANY _____
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USEFUL NEW BOOKS & GOVERNMENT PUBLICATIONS

Defining Engineering

ENGINEERING AS A CAREER. *By Ralph B. Smith. McGraw-Hill Book Co., 330 W. 42nd St., New York City 36. 1956. 365 pages. Price:* $4.75.

Though it is designed primarily for freshman engineering orientation courses, book is of interest to food processors. It provides a clear and interesting appraisal of the qualifications, duties and responsibilities of engineers, as well as an accurate definition of the engineering profession in terms of functions as well as branches.

Metalworking Guide

A MANUAL OF PROCESSES. *Published by Wallace Supplies Manufacturing Co., 1500 Diversey Parkway, Chicago 14. 1956. 170 p. Price:* $2.50.

This book is divided into four sections: two on cold bending and two on abrasive cut-machining of metals.

Cold bending section describes types of machines used in forming tubes, pipes and structural shapes; tools for bending; designing and theory of cold bending.

The abrasive cut-machining material deals with the reason abrasive wheels fail and how to prevent this failure, what abrasive cut-machining will do for you. It discusses speed in cutting and quality of cuts.

Operations Report

OPERATIONS RESEARCH *published by Society for Advancement of Management, 75 Fifth Ave., New York City 11, 1956. 144 pages 8½ x 11 in., paper. Price:* $10.

At the meeting of the Society for Advancement of Management in New York City in 1955, nationally known leaders in the rapidly developing new management function of Operations Research presented their views.

This report on the proceedings is comprised of three major sections:

FE REPRINTS AVAILABLE

Listed below are special sections, flowsheet book, and articles from past issues of FOOD ENGINEERING which are available in reprint form. Single-copy prices are listed. For orders of 20 or more, there is a 25% discount. To order reprints, use coupon at bottom of page. You will be billed when your order is filled.

8. Newer Ingredients **$1.25**
Twenty-page report on the newer ingredients which aid in producing better food products (May, 1952). It includes detailed articles on these subjects: (1) Guide to Optional "Chemical" Additives. (2) Antioxidants Provide New Flavor Controls. (3) Industrial Enzymes Now Speed Natural Processes. (4) Food Emulsifiers Bring New Highs in Uniformity. (5) Seaweed Extractives Find Versatile Uses in Foods.

9. Vacuum Cooling **$0.75**
Eight-page special report covering the use of efficient vacuum cooling in a wide variety of food processing operations to save costly process time, reduce labor, increase output, and avoid spoilage losses (October, 1952). Preference data for specific types of applications are presented in this engineering study.

10. Packaging Materials **$1.00**
Sixteen-page report on how to get better production-line performance with packaging materials and containers (March, 1952). It includes these comprehensive articles: (1) Developing Your Package for High Output. (2) How Properties of Materials Affect Packaging Speeds. (3) Nipping Production Slowdowns by Prechecking Supplies. (4) Tips on Ordering Materials for Top Performance. (5) Proper Storage of Your Stock Averts Line Headaches.

11. Sanitation **$0.50**
Six-page report on "How to Assure Top Sanitation in Your Processing Equipment" (Jan. 1952). This report was a reprint of one section of a practical book on food plant sanitation prepared by Association of Food Industry Sanitarians.

12. Materials Handling **$1.00**
Twelve-page report entitled "How Modern Materials Handling Gives New Spurt in Processing" (March, 1951). Case histories of important savings through more efficient handling are presented. And the different types of handling equipment are described and illustrated.

13. Mixing **$0.50**
Four-page roundup of progress in plant mixing methods and equipment, plus a forecast of what is ahead (Oct. 1953). Performance data are included as yardsticks of what can be achieved.

14. Aseptic Canning **$0.75**
Eight pages, including foldout picture flowsheet, describe, evaluate, and illustrate in detail the continuous, short-time, high-temperature aseptic canning process that won the 1951 Food Engineering Award. (June, 1951).

15. Freezing Flowsheet **$0.40**
"Topflight Freezing Line Engineering", November, 1954. Only a few left. Orders will be filled while they last.

Editor, FOOD ENGINEERING, 330 W. 42nd St., New York 36, N. Y.
Please send the following reprints:
(Circle numbers and write quantity in squares)

8☐ 9☐ 10☐ 11☐ 12☐ 13☐ 14☐ 15☐

My Name: .....
Address: .....

history, purpose and organization and functioning of Operations Research; survey of Operations Research covering 310 companies; complete story of an Operations Research study. This last was a study of the Procter and Gamble Company presented by Gifford Symonds of Esso Standard Oil Co., D. F. Howe of Procter and Gamble, and Arthur Brown, John Magee and Peter Strong of Arthur D. Little, Inc.

The Broad View

ORGANIC CHEMISTRY SIMPLIFIED *Second Edition, By R. Macy. Published by Chemical Publishing Co., Inc., 212 Fifth Ave., New York City 10. 1955. 620 pages 8¾ x 5¼ in., cloth. Price:* $12.

Differing from standard texts in that it tries to give the reader a broad view of the topic rather than have him memorize reactions, conditions, and properties, the book may be used as a self-teaching manual. Main emphasis is placed on development of the structures of the various types of compounds on the basis of the electron theory.

Abstract Service Offered

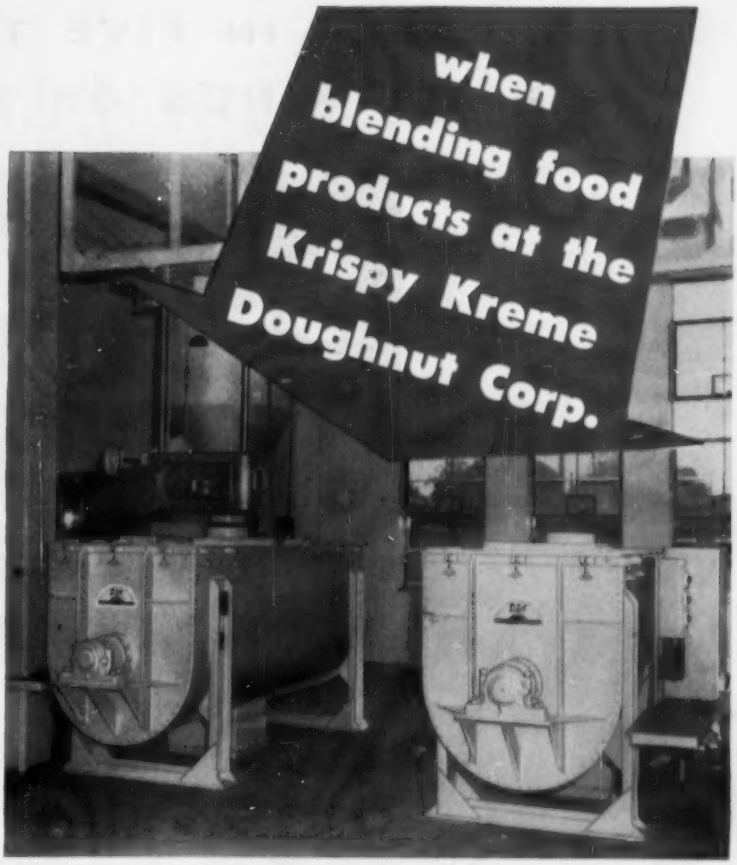
Interscience Publishers, Inc., 250 Fifth Ave., New York City 1, has announced inauguration of a monthly loose-leaf abstract service covering world literature on quality control, operation research and industrial applications of statistical methods of all kinds.

In compiling these abstracts more than 400 journals will be scanned for articles that present new information in the field. Quality control and applied statistics abstracts will consist of one volume of about 1,000 pages each year divided among twelve issues beginning in June 1956. Subscription price is $60 per volume.

Booklets and Reports

APPLICATION OF PHYSICAL SCIENCES TO FOOD RESEARCH, PROCESSING, PRESERVATION. *Published by Institute of Food Technologists, Chicago. 179 p., paper. Price:* $5.00. Proceedings of the first Food Physics Symposium held in March, 1956, at San Antonio, Tex.

SO YOU'RE GOING INTO BUSINESS. *Published by Chamber of Commerce of the United States, Washington, D. C. No charge.* Advice and references for prospective businessmen.



DAY JUMBO MIXERS . . . meet every requirement for maintaining a thorough blend of doughnut mixes under sanitary conditions at Krispy Kreme Doughnut Corp., Winston-Salem, N. C. For instance: seals may be furnished of sanitary construction requiring no packing, and of such simple design as to permit thorough cleaning in a matter of minutes between batches—(no more black specks working into product from stuffing boxes).

Outboard bearings on all models allow plenty of room for normal cleaning and maintenance. Special agitators available for blending high shortening content products. Heating or cooling jackets, dust covers and many other optional features available. For complete information write for Bulletin 800.

in mixing equipment FOUNDED 1887 **DAY** *means longer life span*

THE J. H. DAY COMPANY

4932 BEECH ST., NORWOOD, CINCINNATI 12, OHIO
Division of Cleveland Automatic Machine Company

Quality equipment for baking, paint and varnish, printing ink, chemical, rubber, pharmaceutical, cosmetics, paper and pulp, explosives, food, ceramics, candy, soap, sugar and milk products.

Eastern Canada: Brantford Oven & Rack Co., Ltd., Brantford, Ontario
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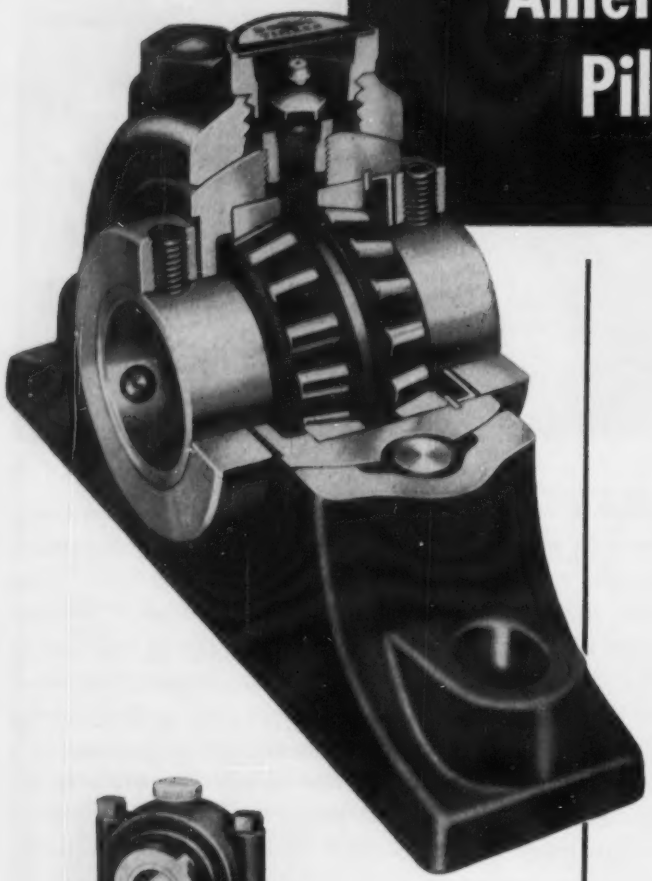
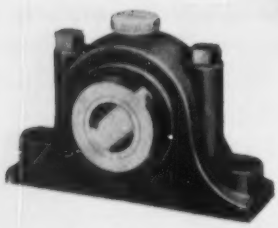
AVAILABLE IN FIVE TYPES
FOR ALL KINDS OF SERVICE

DODGE-TIMKEN
America's Quality Pillow Block





- COMPLETELY ASSEMBLED
- FACTORY ADJUSTED
- PRE-LUBRICATED

Call the Transmissioneer, your local Dodge Distributor. Factory-trained by Dodge, he can give you valuable assistance on new, cost-saving methods. Look for his name under "Power Transmission Machinery" in your classified telephone directory, or write us.

DODGE-TIMKEN Bearings are adjusted, lubricated and sealed at the factory. Labrynth seals effectively retain the lubricant and prevent the entrance of dust and dirt. The inbuilt precision of Dodge-Timken Bearings is protected both on and off the shaft. They are delivered fully assembled, ready to mount.

Where service conditions are toughest Dodge-Timken Bearings prove their quality decisively. For superior performance, dependability and long life they have won their reputation throughout industry as America's quality pillow blocks.

To meet varying service requirements Dodge-Timken Pillow Blocks are available in five types—the type E . . Double Interlock (illustrated) . . Type C . . Special Duty . . . and All-Steel. Available in a range of shaft sizes from 1-3/16" to 10".

Call your Transmissioneer; or write for Bulletin A638 giving load ratings, dimensions and other data on Dodge-Timken Roller Bearings.

DODGE MANUFACTURING CORPORATION
2800 Union Street, Mishawaka, Indiana

DODGE
of Mishawaka, Ind.

KEEPING UP WITH THE FIELD

TECHNICAL NEWS • WASHINGTON HIGHLIGHTS • ECONOMIC TRENDS • LABOR DEVELOPMENTS

Decries "Trade Secrets"

A blow has been struck at so-called "trade secrets" by Leonard Stoloff, Research Director, Seaplant Chemical Corp., New Bedford, Mass.

Scoring the theory that jealously guarded skills and formulas put a processor in a superior competitive position, he declares that such an attitude tends to suppress progress.

Worthwhile technical meetings occur only when individuals realize that they benefit more from their contributions than they lose by their revelations, Mr. Stoloff concludes.

OK's Trailer-Ship Service

Truck-carrying ships are now authorized to ply their trade between West Coast ports by the California Public Utilities Commission (FE April, p. 196).

The firm, Pacific Trailerships, Inc., plans to build two $10,000,000 ships and have them in operation between San Francisco and Los Angeles by early 1958.

Glass-Packed Foods Up

Foods packed in glass containers are headed for new highs in 1956, states the Glass Container Manufacturers Institute.

Shipments through August by 43 glass companies—representing 95% of the industry—total 6,475,968,000 units for foods and beer. This is a 2.8% jump over the ¾-year mark in '55 (6,299,568,000 units).

Invents Non-Stick Gum

That traditional tight affinity between discarded chewing gum and chairs, floors, and shoes is now seen being broken by a non-stick formulation invented by Norris C. Leonard of Nashville.

The new gum—which it's said people with plastic dentures can chew—is made by adding varying amounts of dimethyl polysiloxanes (Dow Corning 200 Fluids) to regular gum-base formulas.

Meat Men Thrash Out Future at AMI

Pressing problems in consumption, nutrition, plant engineering, and processing, got a thorough airing at the recent annual meeting of the American Meat Institute in Chicago.

Result: Some practical thoughts on today's problems, and a look at what lies ahead for the meat men. Here are pertinent summaries from the speakers:

• **Consumption:** Meat supplies are expected to hit an all-time high of 27.7-billion lb. this year, then drop to 27.0-billion in 1957, according to J. Russell Ives, American Meat Institute marketing specialist. Most of the cut-back, he estimates, will come from pork. Beef, veal, and lamb supplies will remain unchanged.

To keep production and consumption at such high levels, however, processors should concentrate on their fresh meats, instead of processed items, states Seth Shaw, Safeway Stores, Inc.

Pointing this theory up, W. H. Brunner, Ohio State U., and H. M. Briggs, Wyoming Agricultural Experiment Station, called on processors to switch to meat-type hogs and steers for leaner, higher-quality meats.

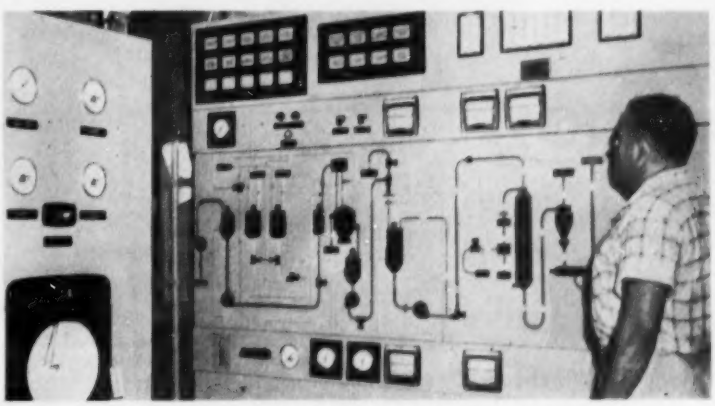
• **Nutrition:** Attention of packers has been focused on heart disease, through discovery that a fat-like material, cholesterol, actively aids this killer. On this subject, Dr. F. J. Stare, Harvard School of Public Health, admitted that dietary intake has changed in the last twenty years. But, he added, it has been a decrease in carbohydrate intake, rather than an actual increase in fat content, that has boosted the percentage of fat in our diet.

Furthermore, the AMI released data from Dr. F. A. Kummerow, U. of Illinois, stating that increased protein intake is responsible for maintenance of low blood cholesterol levels—not a decreased fat diet.

• **Plant engineering:** Several reactor designs are now developed in theory that would successfully serve the dual function of power generation and food processing, declared Lt. Col. B. S. Evans, Jr., Atomic Energy Commission.

But only a limited number of meat products will ever be commercially sterilized by high energy radiations alone, declared J. B. Evans, American Meat Institute Foundation. Greatest promise for the industry now seems to be a combina-

(Turn page)



Central Panel Controls New Instant Starch

Automatic production of a new product—pre-cooked instant starch—is conducted entirely from this schematic control panel at Corn Products Refining Co., Corpus Christi, Tex. The new food—seen particularly ideal for frozen desserts, dry food mixes, instant puddings, and confectionery—is made by atomizing a cooked starch solution through high-pressure nozzles into a special spray drier.

Pfizer's Antibiotic Wins FDA Approval; Firm Will Try to Off-Set Delayed Start

Competition in antibiotic food preservation is expected to become intense, now that Chas. Pfizer & Sons have won FDA approval for their oxytetracycline antibiotic, Biostat-PA.

Formal approval was granted Oct. 16, and became effective Oct. 23 when it appeared in the *Federal Register*. Pfizer can start deliveries the end of November, after the legal 30-day waiting period.

The announcement signals the kick-off for a campaign by Pfizer to catch up with American Cyanimid Co., which has had nearly a year's headstart—without competition—for its Acronize process (containing Aureomycin tetracycline).

FDA has given Pfizer the same rights and limits previously authorized for Cyanimid. Both products will be permitted in amounts up to 7 ppm. on uncooked, dressed poultry. Tests show that poultry shelf-life can be doubled by treatment with antibiotics.

However, in marketing, the two companies differ radically. Cyanimid signs poultry processors under a franchise agreement—regulating them strictly as to how antibiotic is used in the plant, and setting up quality control and sanitation standards processors must meet to keep their franchise.

Pfizer will use a more open selling route. Biostat will be handled by the firm's Chemical Div. on the same basis as any other chemical, and sold in a poly-lined, 2-kilo metal can. With each can, the customer gets a special measuring spoon to simplify formulation of the bath.

The company will insist that customers abide by minimum labeling requirements of the Food and Drug Law, but impose no regulations of their own.

Meat Men at AMI (Cont'd)

tion of low level radiation (100,000 rep.) and a tetracyclin antibiotic (10 ppm.). In tests, the combination has markedly increased shelf-life of beef under refrigeration (30-35F.).

• **Processing:** Considerable savings in operating and maintenance costs can be derived in chill rooms by using "dry" coil equipment, stated D. D. Wile, Refrigeration Engineering, Inc.

Sausage kitchens will soon be entirely automatic. The one piece of equipment needed for the automatic transition is a meat pump—now on the drafting boards and soon to be in distribution, said A. B. Mauer, Mauer-Neuer, Inc.

A new stunning tool, employing a captive, impact-type bolt, was detailed by C. H. Eshbaugh, Swift & Co. The long-handled tool, powered by 22-caliber cartridges, is said to deliver a more accurate blow and require much less operating effort, than the old-fashioned hammer.

Candy Sales Jump 7%

Packaged chocolates and candies have paced an overall rise of 7% in confectionery sales during the first seven months of '56 over the same '55 period, declares Philip Gott, President, National Confectioners' Assn.

Biggest jump (16%) is in packaged goods retailing from 50 to 99c. per lb. Bulk products slumped 2%, he adds.

Pneumatic Warehouse Offers 64,000 cu. ft. of Space

This dome-shaped portable balloon is seen as the answer to temporary storage of food products by U. S. Rubber Co. Measuring 80 ft. long, 40 ft. wide, and 20 ft. high, the unit contains over 64,000 cu. ft. of storage space. It's made from a tough, vinyl-coated nylon fabric. A low-pressure pump or blower is used to inflate structure, and will keep it erect even when doors are open for loading. Rubber tube at base, containing 23,000 lb. of water, holds balloon on ground. Calumet Industrial District Co. will make, sell, and lease the warehouse.

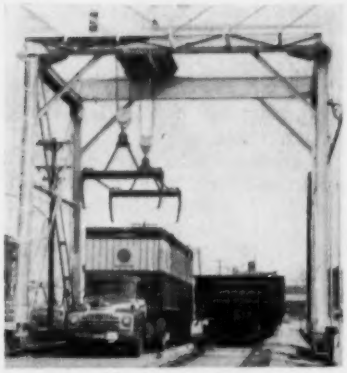
Opens New Science Center

Two pilot plants and numerous food, product control, and chemical laboratories are housed in this new 3-story, 88,000 sq. ft. research center—just opened by Quaker Oats Co. at Barrington, Ill. Over 100 scientists and technicians will use the facility to further probe basic research in human and animal nutrition, develop new foods, and maintain quality on company products.

'Dairy Water' in Disasters

Emergency drinking water—put up in fiber milk cartons by local dairies—is object of a new plan, announced by Federal Civil Defense Administrator Val Petersen, and backed by dairy industry groups, container manufacturers, and Federal welfare agencies.

Tested at Stroudsburg, Pa., during hurricane Diane in 1955, the operation calls for dairies adjacent to any disaster area to convert their lines to production of safe water for distribution in the stricken region.



Only The Body Goes By Rail

New method for "piggy-backing" truck trailers on railroad trains eliminates dead weight of trailer chassis. The system, recently started by Missouri Pacific Railroad, requires a special, detachable truck body. A gantry crane whips body from chassis to rail car in a matter of minutes. Process is reversed at destination, and body is locked to truck chassis for local delivery.

HORS D'OEUVRES

▶ **An Armour Research Foundation scientist has invented a tripod bottle holder for infants. Sort of a three-legged mother with unlimited patience.**

▶ To protect women workers from corn rash, Green Giant has come up with talcum powder containing hexachlorophene. Well, anything to preserve the skin you love to touch.

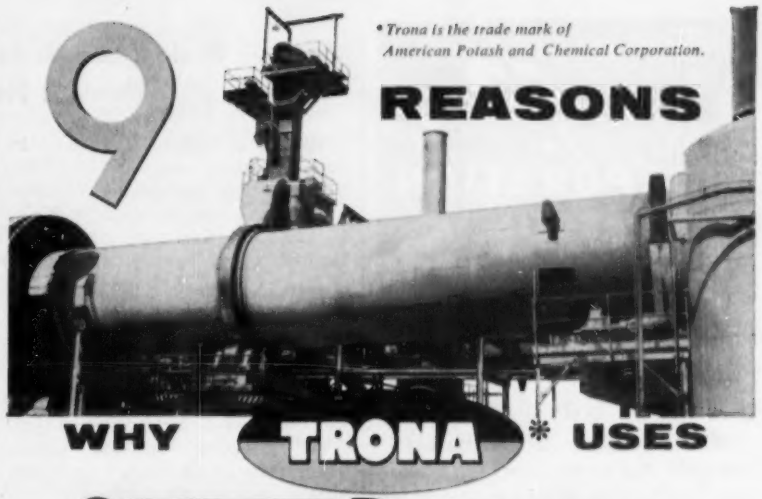
▶ **A Dutch industrialist is mass-producing synthetic coffee beans claimed to make as good a brew as the real thing at half the price. If he is so clever, why doesn't he synthesize instant coffee?**

▶ Only way to break the hefty South American coffee prices is to "stop drinking coffee," says Bill Black, president of Chock Full O' Nuts Coffee Corp. He constantly tells consumers not to pay the higher prices asked for his coffee unless they have a gourmet's taste. Such courage should be rewarded—and is—with increasing sales.

▶ **For a fast-moving atomic war, the armed forces need something more convenient than convenience foods. Looks like processors will have to take the "heat" out of "heat-and-eat." Maybe a pre-fueled package with a built-in fuse?**

▶ What motivates the masses? When it comes to effective food labels, words like "New," "Improved," "Fresh," and "Instant" are effective. When it comes to other things, maybe Freud had the right idea.

▶ **According to Rutgers, Romans were the first to use a frozen vegetable. They preserved asparagus in the snows of the Alps—at a distance, where it would not defrost while Nero fiddled.**



*Trona is the trade mark of American Potash and Chemical Corporation.

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PILOT TESTING

New Package-Imprinting Attachment

makes accurately-located, high-quality imprints on side of cases, crates, cans, etc.

Model "750" ROLAPRINTER machine . . . imprints contents identifications, other legends on side surface of set-up cartons and cases, rectangular metal cans, wood crates, wire or strap-bound bundles, etc. Attaches to conveyor, case-sealer, other production equipment. Not just another "marker" but a precision imprinter that gives "printing-press" results. Also available for imprinting all 4 sides.

This new unit is fully automatic, operates by means of microswitch-activated electro-mechanism that registers imprints accurately; has built-in motor-driven flexographic printing system that synchronizes with surface speed of package. Uses fast-drying liquid ink of any color and rubber type or dies.

Write for descriptive Bulletin RIN-5

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Automatic Production-Line CODING, MARKING IMPRINTING MACHINES

CORED SIGMA BLADE

1500 lb. stainless steel sigma blade not only has to be corrosion resistant and dimensionally accurate, but a 1½" cored hole, centrally located with respect to the various cross sections is required throughout its length

The full story is told in Cooper Alloy AKH #4

KEL-F LINERS FOR VANTON PUMPS

The addition of Kel-F to the long list of rubbers and plastics now available for liners makes the Vanton pump suitable for handling such media as fuming nitric and other strong oxidizing acids, mineral acids, alkalies, aliphatic solvents and hydraulic fluids.

Details on request.

STAINLESS STEEL RETARDERS

Cooper Alloy stainless steel retarders in the Cyclotherm Generator help to produce additional heat transfer with maintenance-free reliability. Known as Cyclotherm Cyclonic Combustion the new principle delivers a guaranteed 80% heat transfer in two passes and drops maintenance costs as much as 50%.

COOPER ALLOY
CORPORATION • HILLSIDE, N.J.

Basic Research to Reach All Scientists Through New OSI Agency

Results of thousands of basic research projects, carried out by private and academic groups with Federal money, will soon be made available to "research scientists everywhere" through a new governmental agency.

Aim of the program: To provide any researcher with the same kind of information on private studies that Uncle Sam has long furnished on its own developmental work.

Spearheading the new system is the Office of Scientific Information (OSI) of the National Science Foundation. OSI has set up a new agency—the Government Research Information Clearinghouse (GRIC) to handle the deal. It will enable research scientists to:

- Learn what unclassified scientific reports are being issued in their fields of interest, and how they can obtain them.
- Obtain, on a subscription basis, a report that automatically keeps them posted on new work in fundamental research.
- Have access to a well-catalogued reference collection of the scientific reports. This will be maintained in the Library of Congress with the help of a $10,000 grant.

Dwight E. Gray, who heads up GRIC, estimates that the government now receives upwards of 20,000 technical reports per year from government-sponsored studies. Only a part of these ever found a place on the old OSI sales list.

The new program is expected to boost publication of technical papers to about 12,000 per year—double the present rate—and will only exclude classified projects (about half of all the papers) and, at present, research conducted by and for the Agriculture Department. The latter agency already publishes a widely-circulated bibliography and several bulletins on its investigations.

Sanitizers for Hard Water Now Under USDA Control

Processors operating plants in hard-water areas of the country are afforded new protection by a law governing germicidal chemicals used for cleaning equipment.

All manufacturers selling such compounds—and specifically recommending them for hard water use—must now submit adequate experimental data to back up their claims. And they must have their labels, ingredients, and application directions registered and approved by USDA.

Hard water slows down action of disinfectants and sanitizers. And the new standard, developed by U. S. Public Health Service, measures killing power of the germicide in water artificially hardened with magnesium and calcium chlorides.

Multi-Pack Boosts Sales

Dramatic increases in sales of canned corn are noted when product is displayed in multi-packages of three, four, and six units. Such is the result of National Canners Assn.'s second Philadelphia Project, conducted in cooperation with American Stores Co.

When the 3-can and 6-can packs were displayed with single cans, sales ran 27% and 31%, respectively, above normal single-can sales. However, when the multi-packs were displayed alone, customers broke them open to get single cans. And sales slumped below normal single-can purchases.

New Lab Probes Fats, Oils

Glidden Co. has swung the doors open on a brand-new research center in Cleveland. Laboratory is designed to give top-flight service to processor's using Durkee brand products, and to delve into background research in edible fats and oils. Here, researchers test coatings for cracker bakers and confectioners (foreground) and frozen desserts and whipped toppings for dairymen (rear).

DOW PROPYLENE GLYCOL, U. S. P.

THE SOLVENT TO IMPROVE FLAVOR PRODUCTS

. . . has become an accepted standard for flavors, extracts and flavor concentrates

Watch those eyes light up—when your flavor product is made with Dow propylene glycol, U.S.P. Add this flavoring advantage to economy of manufacture made possible with this efficient Dow solvent, and you have two excellent reasons to specify it for your own use.

Remarkable savings have been achieved—with only minor reformulation—by many makers of food colors who replaced other solvents with propylene glycol.

Then there's dependable quality and prompt delivery of Dow propylene glycol, U.S.P. . . . something you can depend on to simplify your own production problems. A free sample and property information are yours for the asking from THE DOW CHEMICAL COMPANY, Midland, Michigan, Dept. OC 853H-1.

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DOW

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how TITANIUM

can tame the corrosive pickle...

Processors of pickles, catsup, or other foods with a high chloride content, know how quickly they attack kettles and other equipment of ordinary metals. Corrosion causes frequent replacements and troublesome shutdowns.

Titanium can be the remedy. For REM-CRU titanium is unaffected by chlorides and most organic products. It is completely impervious to salt water or brines which normally cause pitting in other corrosion-resistant structural metals.

What's more, titanium can not contaminate food products . . . adds no unwanted 'metal-taste.' And titanium's light weight—it's as strong as steel, but 40% lighter—makes equipment easier to handle.

REM-CRU titanium is now available for *prompt* delivery in most sizes and types. Why not let a REM-CRU engineer help you decide how to put this versatile metal to best use in your plant?

To keep abreast of the latest developments on this vital metal, write to Dept. F-11 for the Rem-Cru Review—a free periodical presenting the latest technical data on titanium alloys.

REM-CRU TITANIUM

REM-CRU TITANIUM, INC., MIDLAND, PENNSYLVANIA

Phosphate Residues Toxic, So FDA Tightens Tests

Discovery that combinations of organic phosphate insecticides give very high toxicity in food residues has lead FDA to tighten testing rules for such compounds.

Under new regulations, manufacturers must now gage safety of their latest phosphates by feeding them to animals alone–and also, with each phosphate insecticide already approved.

Since five of these chemicals–parathion, methyl parathion, malathion, EPN, and Systex–already have official tolerances, testing burden on the manufacturers will be increased six-fold. Result will be much longer delays in getting new insecticides on the market.

Coin Vendor Gives Discount

Bargain prices for multiple purchases have now been built into vending machines by Rowe Manufacturing Co., New York City.

The automatic, coin unit–located in W. Nyack, N. Y.–dispenses two quarts of milk for 47c. (Customer puts in two quarters, gets 3c. in change). A companion machine sells single quarts at 25c.

Bans Sugar in Fresh Juice

Addition of sugar to fresh orange juice is virtually prohibited in Florida, following a State Supreme Court decision that reversed an earlier circuit court ruling in favor of Golden Gift, Inc., Deland processor (FE Jan., p. 184).

The decision, which industry spokesmen say will have terrific impact on the fast-growing chilled orange juice business, permits the Florida Citrus Commission to brand as "substandard" any fresh product containing sugar.

Birdseye Dead at 69

The food industry has suffered a keen loss with the death of Clarence Birdseye, 69, on October 7, in New York City.

Particularly noted for his method of quick-freezing foods between two, refrigerated metal plates, Birdseye parlayed this development into a successful company – then sold the process to Postum Co. (later renamed General Foods) in 1929 for a reported $22,000,000.

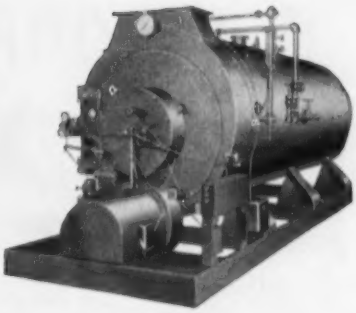
CLARENCE BIRDSEYE
"There's a better way to do it"

Following his maxim, "There is always a better way of doing it," he then became a restless, free-lance genius. Subsequent inventions ranged from a fast method for dehydrating foods to a kickless harpoon gun and an automatic fishing reel.

At his death, Birdseye was president of Process Evaluation & Development Corp., a firm associated with W. R. Grace & Co., N.Y.C.

U. S. Helps Jordan Up-Date Processing

The magic touch of the International Cooperation Administration is now reflected in many foreign lands by new products and improved food processing techniques. This up-to-date sausage operation in Jordan was financed through the Point IV Development Assistance Program. Technical knowledge was supplied by a U. S. food specialist, Dr. T. L. Swenson, Berkeley, Calif. Equipment is German.



Here's CYCLOTHERM'S *3-WAY CUT* in STEAM PROCESSING COSTS!

If you process by steam, use steam by Cyclotherm. You cut costs in these three vital ways:

FUEL COSTS

Cyclotherm Cyclonic Combustion means just what it says—controlled fuel and air, whirling at 200 mph, forming a cyclone in the furnace! This high velocity burning assures maximum efficiency in combustion and heat transfer, resulting in lower fuel consumption.

MANPOWER COSTS

A fire without a fireman! Electronic controls operate the Cyclotherm safely and automatically. Smaller models cycle on and off as steam is required. On larger models, precision modulation coordinates the fuel-air ratio to the load demand, from 30% to 100% of rated capacity.

INSTALLATION AND MAINTENANCE COSTS

Cyclotherm is factory assembled and factory pre-tested. All you do is make five simple connections. 50% maintenance savings are not uncommon. Return tubes cleaned in minutes with no removal or replacement of refractories. No standby unit needed.

And remember—one-third smaller than ordinary generators of similar capacity, a Cyclotherm fits almost anywhere. Many plants have installed two Cyclotherms for utmost flexibility and power. Burns gas or oil with quick changeover. 18 to 500 hp, 15 to 200 psi.

YEARS AHEAD IN STEAM GENERATION
CYCLOTHERM®
STEAM AND HOT WATER GENERATORS

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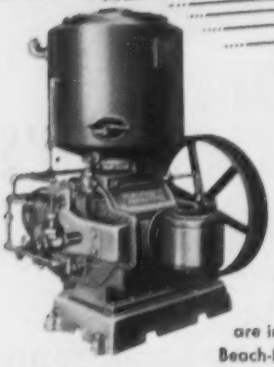
from SOUP to NUTS...

BEACH-RUSS VACUUM PUMPS for ALL your food processes



Beach-Russ has been a pioneer in aiding food processors and food equipment manufacturers in the design of new methods of processing and packaging food products through the use of vacuum. Beach-Russ Vacuum Pumps are available in a range of types and sizes to meet all your vacuum needs from 1 to 1800 c.f.m., at high or low vacuums. If you are planning a new installation or are in need of technical advice, get in touch with Beach-Russ. General Bulletin 89 sent on request.

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✓ DRYING ✓ DEHYDRATING ✓ RESEARCH

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LA PORTE
moves food up · down · horizontally

You can handle every food conveying operation, from loading hopper to shipping dock, with this versatile, sanitary belt that is quickly and easily converted for flight conveying by attaching the La Porte cleat.

The steel mesh feature allows circulation of air and liquids around products in process; also facilitates cleaning and sterilizing with steam gun or hot water. La Porte belting will not weave, creep nor jump. Its rugged construction assures long, economical service and low maintenance costs.

Available in any length and practically any width.

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Before his death of a heart attack, Birdseye was president of Process Evaluation & Development Corp., a company associated with W. R. Grace & Co. and John W. Bolton & Sons, Inc. He had just built the first successful mill for converting sugar bagasse into paper, located in Paramonga, Peru.

Probes Poultry Quality

Role played by aging, scalding, and mechanical handling in tenderness of frozen poultry is strongly emphasized by USDA's WURB, Albany, Calif. The new facts were revealed by a continuing program that aims at uncovering all factors affecting poultry quality.

Aging birds in ice for a period of 24 hr. before freezing definitely increases tenderness, the researchers confirm. However, most of the effect is gained in the first 6 hr.

Toughness is markedly increased when chickens take a heavy beating in picking machines. Likewise, long scalding times and high temperatures reduce quality of the birds.

BRIEFLY

• FOOD ENGINEERING field is explained in a new booklet issued by Illinois Institute of Technology, Chicago.

• **SALES GADGET employed by H. J. Heinz Co. is an ingenious dispensing rack for baby foods. The gravity-roll unit keeps store displays neat and instantly available to shoppers.**

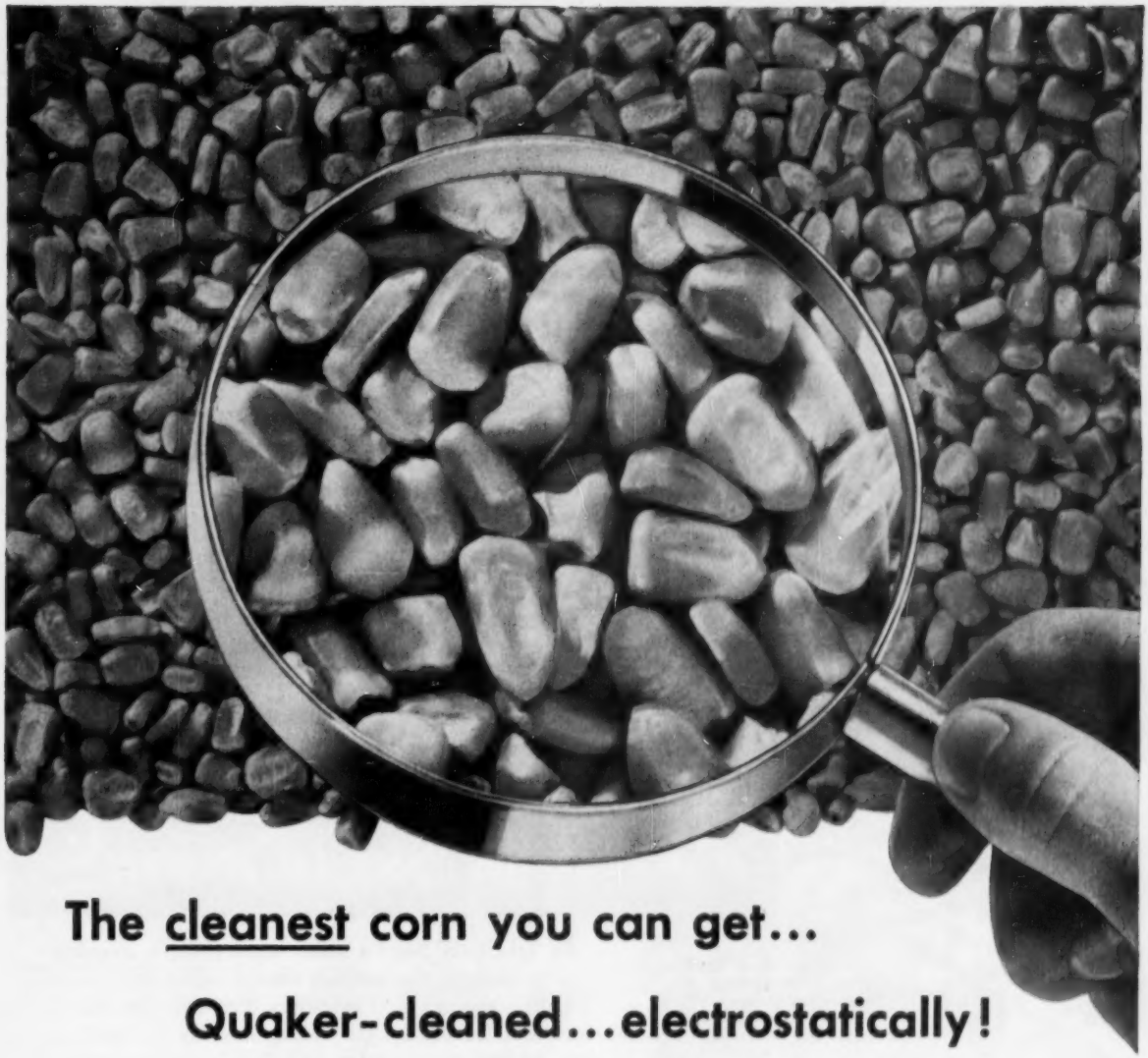
• CITRUS JUICES will soon be marketed by Hawaiian Pineapple Co. under its Dole label. Firm has made a long-term production agreement with Ridge Citrus Concentrates, Inc., Davenport, Fla.

• **SAUERKRAUT is one of the best sources of vitamin C, says N. Y. State Agricultural Experiment Station researchers. But it would be even higher if more attention were paid to time and temperature storage conditions in the vats.**

• FUEL INJECTION SYSTEM has been successfully developed for internal combustion engines by Borg-Warner Corp. The unit is eventually expected to replace conventional carburetors in cars, tractors, and trucks.

• **FROZEN PEA PACK has hit an unprecedented high this year of 352,215,-604 lb., according to a survey by National Assn. of Frozen Food packers. This is a skyrocketing 52% over the '55 figure (231,000,000 lb.).**

• NEW AWARD for best analytical methods of the year is offered by the



The cleanest corn you can get...

Quaker-cleaned...electrostatically!

No other method can touch the efficiency of Quaker's electrostatic cleaning of grain. Even removal of rodent contamination from corn is easily accomplished at Quaker.

Electrostatic cleaning operates on the ability of different particles to take on different degrees of an electrostatic charge. Other methods depend only on differences in size and weight of the materials to be separated. But because these materials carry varying degrees of electrostatic charge, Quaker's electrostatic cleaning also *removes* contamination of the *same size and weight* as the material being cleaned.

Years of testing in plant operation shows that electrostatic cleaning is able to remove far more rodent contamination from corn of commercial milling quality than other methods—without sacrificing yield. This same cleaning superiority applies to almost all grains with similar contamination problems.

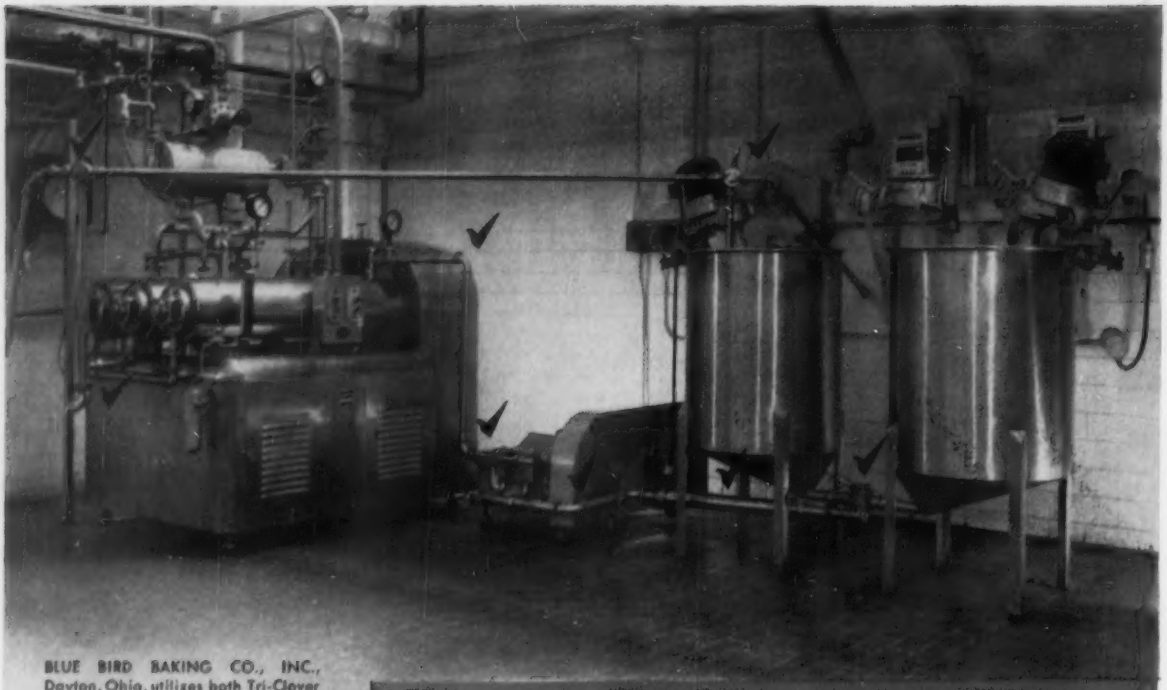
Electrostatic cleaning is another example of Quaker's creative milling—producing *clean* grains to make *your* food processing easier and more profitable.

In addition to producing *clean* grains, Quaker makes electrostatic cleaning equipment (under the name CORONATRON®) available to food processors. For information about *any* processing problem—or about the purchase of this equipment—call or write Industrial Food Sales, The Quaker Oats Company, Chicago 54, Illinois.

QUAKER

Imagination in Milling—
to solve your processing problems.

For more data, circle this page number on card at back →



BLUE BIRD BAKING CO., INC., Dayton, Ohio, utilizes both Tri-Clover Standard Sanitary and TRI-CLAMP® Fittings and Valves, as well as a Tri-Clover Filter, in this mixing tank setup, where pie fillings of various types are mixed for the well-known Blue Bird pies.

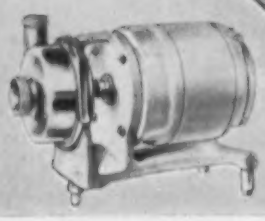
TRI-CLOVER SANITARY FITTINGS and PUMPS

help bakeries *"plan for progress"*

Tri-Clover stainless steel valves are available in a wide range of types and sizes to meet your requirements.

A complete line of standard sanitary threaded stainless steel fittings is available for use in the baking industry.

Thin wall, light gauge stainless steel tubing from Tri-Clover gives strength, light weight and overall economy to your conveying line installation.



Tri-Clover Sanitary Centrifugal Pumps, fabricated of highest quality corrosion-resistant metals, are widely used to meet baking industry requirements for efficiency and long-term service.

Tri-Clover has for many years made a complete line of stainless steel sanitary fittings, valves and pumps for the dairy and food industries. This complete line is available for use by the baking industry in handling liquid sugar, syrups, water, milk, frosting and other baking ingredients.

To help you "plan for progress," in meeting the demand for new and improved baking operations, Tri-Clover can meet all your piping and pumping needs relative to installation of liquid ferment, or brew, processes, as well as for pneumatic flour handling systems.

Why not let Tri-Clover fittings and pumps help to achieve new standards of efficiency and sanitation in *your* bakery operations? Let our engineering staff help in solving your specific corrosion-resistant liquid conveying line problems. *Write for further information.*

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Assn. of Official Agricultural Chemists in the name of Harvey W. Wiley, founder of the Federal Pure Food & Drug Law.

Action on Standards

Following actions have been taken by the Agricultural Marketing Service (AMS) and Food & Drug Administraton (FDA) on U.S. Standards and allowable tolerances of various pesticides on raw agricultural commodities. References are to *Federal Register*.

Tomatoes, fresh, AMS proposed revision of U.S. Standards, *F.R.*, Sept. 11, p.6862.

Sweet peppers, frozen, AMS establishment of U.S. Standards, *F.R.*, Sept. 11, p. 6857.

Oranges, AMS proposed revised U.S. Standards, *F.R.*, Sept. 21, p. 7187.

Sugarcane syrup, AMS proposed revised U.S. Standards, *F.R.*, Oct. 2, p. 7544.

On barley, corn, oats, popcorn, rice, rye, sorghum, wheat, beans (string), bitter melon, cavendish bananas, citrus fruits, cucumbers, guavas, mangoes, papayas, peppers (bell), pineapples, and zuccini squash, establishment of tolerances for ethylene dibromide, F.R., Sept. 22, p.7212.

On grapes, proposed tolerances for Diuron 3-(3, 4-Dichlorophenyl)-1, 1-dimethylurea, *F.R.*, Oct. 11, p.7774.

Schedule of Events

November

25-27—National Sanitary Supply Assn., trade show; Ambassador Hotel, Los Angeles.

25-28—American Society of Refrigeration Engineers, semi-annual meeting; Hotel Statler, Boston.

26-27—American Corn Millers Federation; Drake Hotel, Chicago.

26-30—American Society of Mechanical Engineers, national power & engineering exposition; Coliseum, New York City.

27-30—American Chemical Society, national Trade Show Bldg., New York City.

26-30—International Automation Exposition; exposition; Public Auditorium, Cleveland.

December

4—Eastern Frosted Food Assn.; Belmont-Plaza Hotel, New York City.

4- 6—National Flexible Packaging Assn., annual meeting; Biltmore Hotel, New York City.

6- 7—Tri-State Packers Assn., annual meeting; Haddon Hall, Atlantic City.

10-11—Material Handling Institute, annual meeting; Biltmore Hotel, New York City.

10-12—Western Frozen Food Processors Assn., annual meeting; Hotel Coronado, Coronado, Calif.

QC on the Line

—Continued from page 55

adopted many unique ideas in materials handling that also serve to up quality by protecting materials from damage and by speeding in-line movements.

Biggest time and money saver is the method for handling the live chickens, which are picked up from the growers in multi-compartment wire-mesh-cage "batteries".

The birds never leave these containers until they are hung on the picking line. Semi-trucks, with open sides to increase ventilation, transport cages to the plant. Here, fork trucks move them to the feeding room.

The batteries can be carried by either regular fork lift trucks, or by special trucks that have had the forks removed and little L-shaped hooks substituted. With the latter rig, cages are carried by the ends, where hooks fit into special holes in the angle-iron cage-frames.

At the killing station, cages are placed on hydraulic lifts. With merely a touch of a toe pedal, workers lift the batteries and spin them around for easy unloading of either side or any level.

On both picking and eviscerating lines, birds are conveyed by monochains (Link Belt). All line equipment is powered by variable speed drives to meet changeable production demands.

After killing and picking, birds are placed in moveable bins, with ice, to remove animal heat. Ice and water are simultaneously added to these hoppers at a special icing station (see photo).

When birds are ready for evisceration, a lift truck with rotating forks upends the bins and dumps the chickens into specially constructed draining hoppers. In the latter, bottoms are composed of crossed rods of ½-in. stainless steel, thus permitting ice and water to drain before birds are hung on the eviscerating conveyor.

Preparations on the pie line likewise are sped by quick methods.

Dough is formed in 570-lb. batches from block shortening, sifted flour, dextrose, salt, and water. Mixing is done in large wheeled tubs. These are then quickly elevated and inverted by a new dumper (Artofex). The dough falls onto kraft-paper-covered skids. Paper is folded over the dough for protection, and a walkie lift truck whisks load to the chilling room.

Skids stand above the floor on long legs, and thus form a low, con-

PALMER

presents

an outstanding improvement in

DIAL THERMOMETERS

external calibration

Full 3½" Dial Face

- No Sector
- No Pinion
- No Linkage
- Constant Accuracy
- Easy Readability

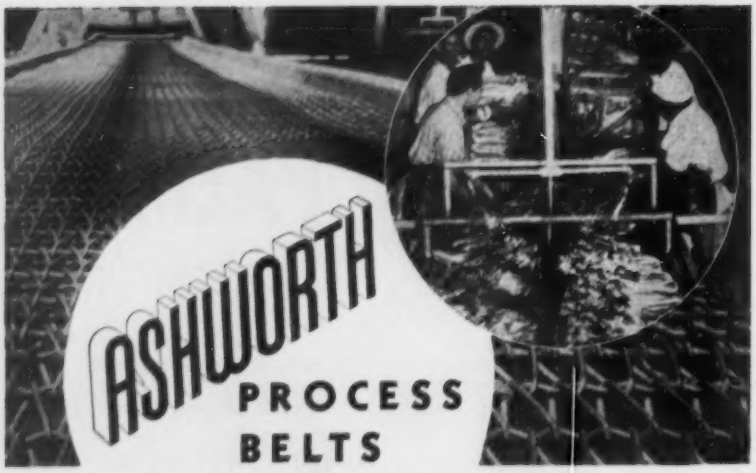
WRITE FOR BULLETIN 350

PALMER

THERMOMETERS, INC.

Norwood Ave., Cincinnati 12, Ohio

Mfrs. of Industrial Laboratory Recording and Dial Thermometers



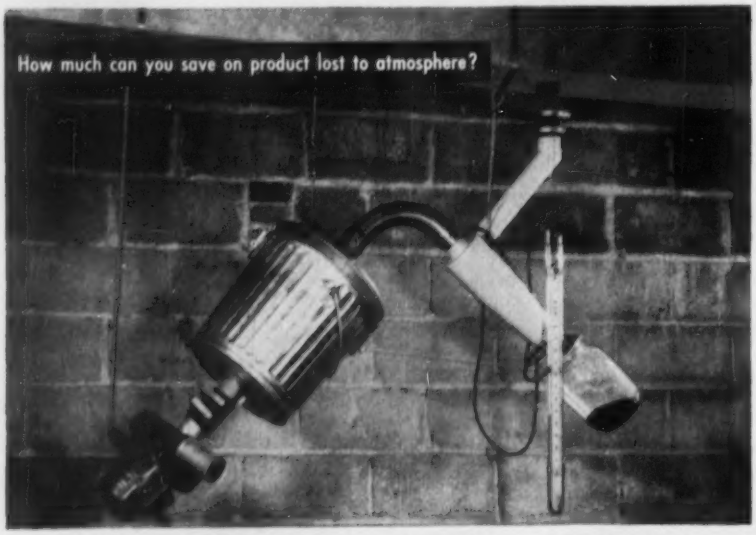
Fabricated from the correct type of wire for the job, and in a full range of mesh specifications and designs, Ashworth belts are effecting savings in continuous processing in BLANCHERS — BRINE TANKS — COOKERS COOLERS—CUTTING TABLES—DESANDERS—DRYERS—EVAPORATORS — INSPECTION TABLES — PACKING — PEELING AND CORING — SPRAY WASHERS — STERILIZERS — WEIGHING.

KEEP YOUR PRODUCT ON THE MOVE

ASHWORTH BROS., INC.
WINCHESTER, VIRGINIA

WRITE FOR ILLUSTRATED CATALOG E-55

Sales Engineers: Atlanta • Buffalo • Charlotte, N. C. • Chicago • Cleveland • Dallas • Detroit Greenville, S. C. • Los Angeles • Louisville • New York • Philadelphia • Rochester Seattle • St. Louis • St. Paul • Canadian Rep., PECKOVER'S LTD., Toronto • Montreal



The PROOF is in this TEST!

Don't let valuable product go up your stack when you can bag it for profit! Need proof of this statement? Dustex can give it to you with the simple test equipment illustrated which gives accurate figures on efficiencies, hourly collection rate and stack losses, if any, to be expected after installation of Dustex Collectors. This test is run without shutdown or interference to production and gives you the facts as they apply to your individual operation. Used throughout the food and chemical industries for the dry collection of fines without filter media, Dustex Collectors are operating with efficiencies of 99.5%+ on a diversified list of products ranging from spray dried coffee to polyvinyl chloride. For proof on how you can bag more profit—request a copy of our Determination Test booklet.

Dustex CORP.
BOX 2520 BUFFALO 25, N. Y.

venient table for the pie line operator to work on.

Pie meat is received in frozen blocks, and run through an ice crusher-type unit that breaks it into small pieces. These are caught in pans and rushed to the line on wheeled tables. Meat never thaws out completely—thus, avoiding possible loss of quality.

Particular attention has been paid to packaging on the pie line—both because of the need for speed (better than 140 cartons/min.) and because of the special problems posed by the square package (5½x5½ in.).

Cartoning of the pies was solved with a newly developed machine (Marapak) that opens each package and inserts pie from the side—in a horizontal manner.

Cartons are overwrapped on a high-speed unit (Model FFH, adapted by Package Machinery Co. for the operation). This unit, while limited in adjustment, was found to have enough room on the castings for installation of the special wrappers without revamping the frame.

With the fryers, the cut up parts of birds are first wrapped in cellophane (on a single line) before being placed in the carton. A parchment-wrapped package of giblets is included in the pack. After check weighing, a lithographed carton top is placed over the bottom according to weight. There are three divisions: 1 lb. 10 oz., 1 lb. 12 oz., and 2 lb. Carton tops vary in depth for the three weights though linear measurements for all sizes are the same.

On both pie and fryer lines, packages are stacked on freezer trays with spacer sticks between each row. These help in de-traying product, and particularly keep freezer plates from squashing cartons.

End (Resume reading on page 56)

Mechanized Accounting

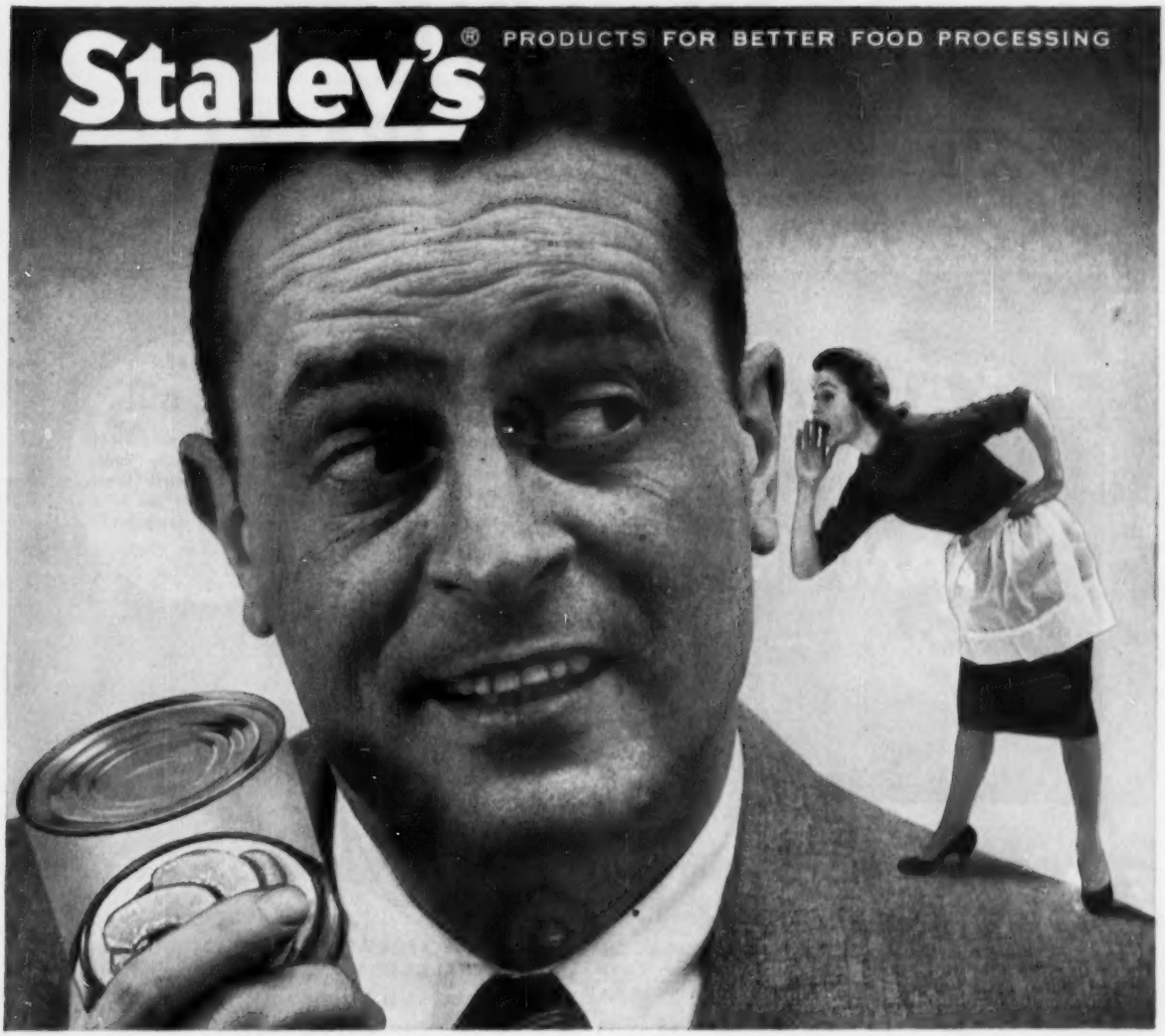
—Continued from page 39

We sped shipping operations by providing the shipping department with a carbon copy of the salesman's order, the original going to the IBM room for invoicing (Fig. 3).

With order in hand, a clerk selects the pre-punched name-and-address cards of the customer from a tabled rack (there are two cards, one being a "Sold To" and the other a "Shipped To"). Then he moves on to the racks of pre-punched product cards prepared with coded numbers, quantities of cases, and coresponding sales prices.

After a visual check, there is added to the assembly a card pre-

Staley's® PRODUCTS FOR BETTER FOOD PROCESSING



What 10,000,000 housewives demand every day...

They demand flavor, natural color and "sheen"! And if they don't get it, somebody's processed food brand gets the cold shoulder. One of your best quality guarantees is Staley's Sweetose Syrup. This economical enzyme-converted corn syrup gives you *accurate sweetness control*, brings out all the natural, unmasked flavor that homemakers expect. Sweetose builds sales-tempting eye-appeal too, helps hold appetizing texture and color of the original fresh food. Put Sweetose Syrup to work for you now . . . let it help give your customers the tasty goodness they demand. See your Staley representative or write us for more information.

50th ANNIVERSARY YEAR

PRODUCTS FROM CORN Staley's AND SOYBEANS

OTHER QUALITY PRODUCTS
Regular & Intermediate Corn Syrups
Canners Starches
Refined Corn Oil
Zest®, Monosodium Glutamate
Sta-Sol® Lecithin

Sweetose®
SYRUP

A. E. Staley Manufacturing Company, Decatur, Illinois

For more data, circle this page number on card at back →

PROVED BY PERFORMANCE OF *OVER A MILLION* TRAPS!

YARWAY IMPULSE STEAM TRAP

the only moving part

...a small stainless steel valve that literally floats on the condensate load. Gets equipment *hot in a hurry—and keeps it hot!*

Using a theory of thermodynamics never before applied to steam traps, the YARWAY Impulse Trap revolutionized the industry *20 years ago.* Today over a million YARWAY traps have successfully proved the Impulse principle.

Advantages like the following continue to win new users, convince old users to standardize:

- **QUICK HEAT-UP AND EVEN TEMPERATURES OF EQUIPMENT**
- **GOOD FOR ALL PRESSURES WITHOUT CHANGE OF VALVE OR SEAT**
- **SMALL SIZE—LIGHT WEIGHT**
- **ONLY ONE MOVING PART**
- **STAINLESS STEEL—minimum maintenance**
- **WON'T FREEZE UP**
- **A COMPLETE LINE of sizes and types for every requirement**
- **IMMEDIATELY AVAILABLE from 270 local Industrial Distributors**

For free Trap Selector, or 24 page bulletin, write
YARNALL-WARING COMPANY 127 Mermaid Avenue, Philadelphia 18, Pa.

THERE'S A YARWAY IMPULSE STEAM TRAP FOR EVERY NEED

SERIES 60 and 120
For all *normal* trap requirements, pressures to 400 and 600 psi.

½" No. 20-A
For *light loads* on tracer lines, steam mains, small presses, etc.

SERIES 40
For *heavy loads* requiring extra high capacity steam traps

INTEGRAL-STRAINER HIGH PRESSURE TRAP
For *high pressures, high temperatures.* (Flanged or welding connections.)

YARWAY

IMPULSE® STEAM TRAP

OVER 1,000,000 YARWAY IMPULSE STEAM TRAPS USED

punched with the next consecutive invoice number. This card is then punched with miscellaneous data, such as customer's order number, date, sales order number, and delivery time. The lot now goes through a reproducing summary punch machine (No. 519) for consolidation, and is then ready for invoicing.

Itemization, extensions, and total are all calculated and printed by the accounting machine (No. 403).

Meanwhile, the shipping department has "picked out" the order for checking against the machine-produced invoice, which is turned out in septuplicate. Two copies go with the shipment (one for signed receipt) and two are mailed to the customer.

While invoices are being printed whole lines at a time, the 403 is hooked to the 519 machine which simultaneously punches out new accounts-receivable cards. Again sorted (unit 082) by invoice number, they are run through the 403 machine for the invoice sales register.

Once more the cards are re-sorted, this time by customer account number, and the accounts-receivable register is run off. Cards are then collated with those in the accounts-receivable file by an 088 machine.

Valuable sales statistics are obtained from our accounts-receivable cards. Before being replaced in the file, they are reproduced on the 519 to get the monthly sales commission report by account and salesmen's numbers. This shows which salesmen are pushing which items.

Our sales analysis enables us to break down sales to wholesalers and retailers, both by case lots and dollars sums. Macaroni products move in large case lots for fewer dollars than do canned products. Since these reports are run separately for each of our seven sales areas across the country, we easily determine which items sell best in these locations, and which sales are in answer to advertising campaigns.

Delinquent Accounts

For credit and collection control, outstanding cards in the accounts-receivable file are pulled out at the end of each month and run through the 403 for an aged trial balance. In groups under each salesman it shows the customer's name and account number, total owed, how much is current and how much is 30-, 60-, or 90-days delinquent.

Latter cards are removed from the name-and-address file, placed in the delinquent file, and replaced by red cards, which stop the filling

SPEED... SANITATION... SAVINGS...

IN PACKAGING Cottage Cheese, Sour Cream, Potato Salad, Honey, Cream Cheese, Gelatine Salads

You'll speed up production, save a fortune on labor costs, and have better, more sanitary packages, with fully automatic Anderson equipment. Use Model 34-F for any size or make of nesting round cup up to and including pints . . . Model 34F-20 for sizes up to 32 ounces.

MODEL 34 F

DISPENSES—FILLS AND CAPS 18-58 PER MINUTE

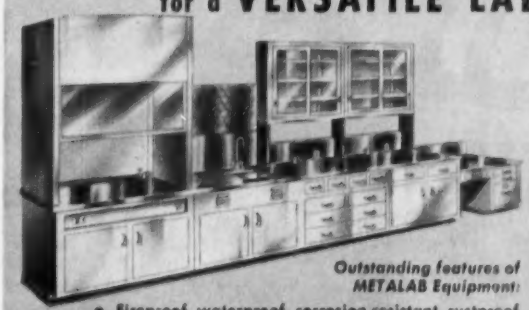
Anderson equipment is preferred for simple operation and dependable performance — proved by actual daily use in dairy and food plants.

Write for Bulletin 11-10

ANDERSON BROS. MFG. CO.
ROCKFORD, ILLINOIS

METALAB

for a **VERSATILE LABORATORY**



Outstanding features of METALAB Equipment:

- Fireproof, waterproof, corrosion resistant, rustproof.
- Exclusive 5-point METCOTE protection throughout.
- Interlocked construction and double welded.
- Bonderized cold rolled furniture steel.

Since your laboratory is a "Testing-Ground" and a source of improved processes and products . . . it deserves the finest equipment. Our planning service is available without any cost or obligation.

Specify METALAB and you are assured of having equipment that is completely versatile, functional, and adaptable to future operational requirements.

The equipment shown here features entire units and illustrates METALAB precision engineered interchangeable type construction.

METALAB *Equipment Company*
DIVISION OF BORGUIP CORPORATION

229 Duffy Avenue, Hicksville, L.I., New York

☐ We are interested in your free planning service.
☐ Please send us your Supplement 55-A. ☐ Please send us your 180-page Catalog 48.

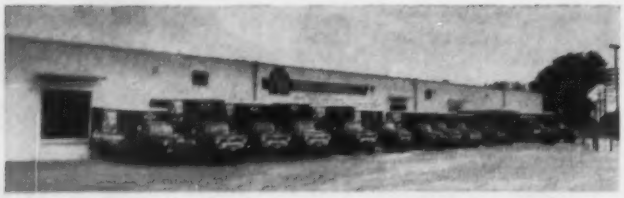
Name _____ Title _____

Organization _____

Address _____

City _____ Zone ____ State _____

Please visit us in Booths 12 & 13, Cleveland Chemical Show, Nov. 27 thru 30.



$500,000 Food Storage in Charleston Kept Cold with

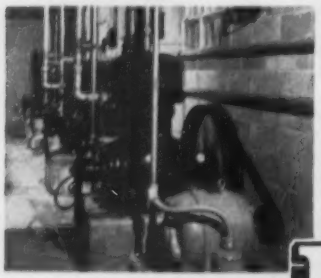
FRICK Refrigeration

Corner of a storage room held at 40° for Pearce-Young-Angel Co.

Pearce-Young-Angel Company serve 17 South Carolina Counties with fresh fruits, produce and frozen foods. Their new warehouse includes three banana rooms, four big cold storages holding a total of 25 train carloads, and two freezer rooms holding three carloads.

Frick refrigeration, installed by the Piedmont Engineering Co. of Charlotte, N. C., carries the entire cooling load with economy and dependability.

Modern Frick air conditioning, ice making, quick-freezing and refrigerating equipment can likely increase profits in YOUR business. Ask for figures today; write



Four of the seven Frick refrigerating machines used by Pearce-Young-Angel at Charleston, S. C.

DEPENDABLE REFRIGERATION SINCE 1882

FRICK CO.

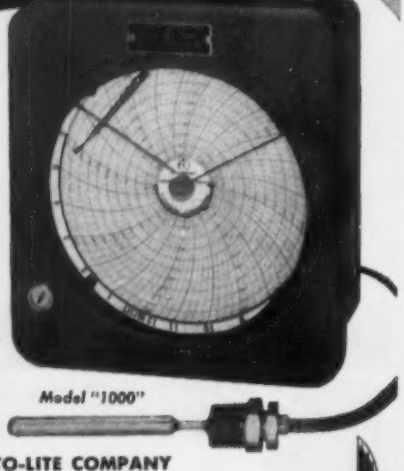
WAYNESBORO, PENNA., U.S.A.

AUTO-LITE

TEMPERATURE RECORDING...

Newly designed, Model "1000" Auto-Lite Recorder gives permanent proof of temperature behavior. • 6" clear reading chart; various standard ranges from minus 40°F. to plus 550°F. • 3 standard types; choice of 24-hr. or 7-day cycle. • Electric or mechanical chart drive. • With capillary tubing for remote reading. Priced from $49.50.

Send for new catalog describing many styles of Auto-Lite temperature Recorders and Indicators.



Model "1000"

THE ELECTRIC AUTO-LITE COMPANY
INSTRUMENT AND GAUGE DIVISION
TOLEDO 1, OHIO
NEW YORK • CHICAGO • SARNIA, ONTARIO

TEMPERATURE RECORDERS

of new orders. At the end of the month, name and address cards are collated with the outstanding accounts-receivable cards. Then a statement, showing in the appropriate columns the 30-, 60-, or 90-days past-due obligations, is run off on the 403 machine.

When any account is 40 days delinquent, a "past due" notice is mailed and after 50 days, a "final notice."

At 60 days, when the next statement is due, a follow-up letter is sent by the credit manager. A final letter goes out 10 days later, and a "collection history" is run off on the 403 for the credit manager's action.

In all, this makes a total of seven pieces of mail run off on IBM machines—a great aid to our collections department.

End *(Resume reading on page 40)*

Modern Lighting Benefits

—Continued from page 50

area because of enclosed duct work.

Eliminating Shadows, Glare

Trouble with the former lighting was that fixtures were placed right over critical work centers where they directed all light downward. Illumination was non-uniform and in some spots, inadequate. As a result, contrasting areas of shadow and glare led to rapid eye fatigue and accident hazard.

Moreover, cleaning of these fixtures was a particular problem because their closed tops were dust catchers.

Thus, the new systems were specifically designed for:

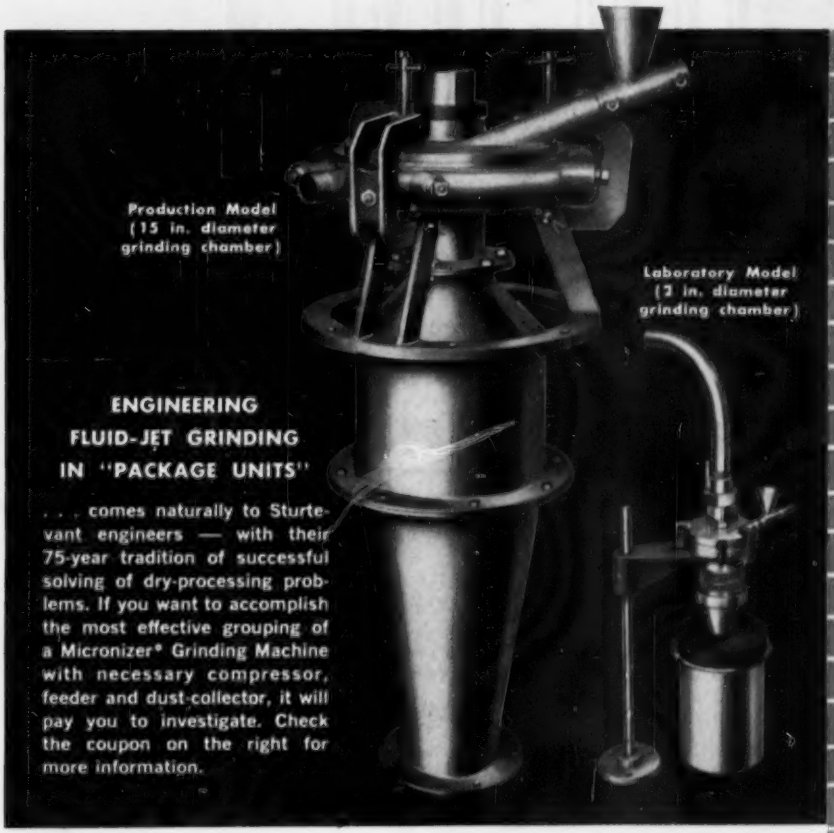
1. **Optimum illumination at the work center.**
2. **Good background lighting.**
3. **Minimum cleaning.**

This is accomplished in the extract-filling department with rows of recessed fixtures installed on 10x10 ft. centers. Ceiling height is 11 ft. There are three 40w. lamps per unit, which delivers a minimum of 20 ft.-candles.

In the spice-filling area, open-top fixtures are suspended 30 in. from the ceiling. A typical 8-ft. unit is about 10 ft. from the floor and houses four 90w. lamps (Standard Cool White, General Electric Co.). Fixtures are spaced on 10 x 12 ft. centers and provide a minimum of 60 ft.-candles.

These suspended units eliminate shadows by supplying a proper distribution of direct and ceiling illumination. About 40% of the light

High Speed Reduction to Micron Sizes — No Attritional Heat!



ENGINEERING FLUID-JET GRINDING IN "PACKAGE UNITS"

. . . comes naturally to Sturtevant engineers — with their 75-year tradition of successful solving of dry-processing problems. If you want to accomplish the most effective grouping of a Micronizer* Grinding Machine with necessary compressor, feeder and dust-collector, it will pay you to investigate. Check the coupon on the right for more information.

Sturtevant Micronizer* Grinding Machines Give Greater Finenesses than Tube or Roller Mills

Look at the record! 30 inch model reduced titanium dioxide to 1 micron and finer at solid feed rate of 2250 lbs. per hr. 24 inch model reduced DDT (50%) to 3.5 average microns — 1200-1400 lbs. per hr. 8 inch model reduced Procaine—Penicillin—to 5 to 20 microns—up to 20 lbs. per hr. Couldn't you use milling performances like these?

No moving parts. The particles grind each other. High-speed rotation and violent grinding impact of particles are caused by jets of compressed air or steam at angles to the periphery of the shallow grinding chamber. There are no problems of attritional heat. Centrifugal force keeps over-sized particles in the grinding zone. Cyclone action in the central section classifies and collects the fines for bagging.

Instant accessibility, easy cleaning. Micronizer* Grinding Machines come in seven sizes — each one constructed for quick accessibility and easy maintenance (typified by the "OPEN DOOR" design in other Sturtevant equipment). Grinding chambers range from the 2 in. laboratory size with ½ lb. per hr. capacity to the 30 in. size which handles up to 3000 lbs. per hr.

* Registered trademark of Sturtevant Mill Co.

STURTEVANT

Dry Processing Equipment

The "OPEN DOOR" to *lower* operating costs over *more* years

CRUSHERS • GRINDERS • MICRON-GRINDERS • SEPARATORS
BLENDERS • GRANULATORS • CONVEYORS • ELEVATORS

My dry-process materials are: _____

Desired capacity is: _____

Name _____ Title _____

Firm _____

Street _____

City _____ Zone _____ State _____

STURTEVANT MILL COMPANY 106 Clayton Street, Boston 22, Mass.

Please send me your Micronizer* Bulletin ☐
Also bulletins on machines for:

☐ CRUSHING ☐ GRINDING ☐ PULVERIZING
☐ SEPARATING ☐ BLENDING ☐ MIXING
☐ SUPERFINE SELECTING ☐ GRANULATING ☐ CONVEYING

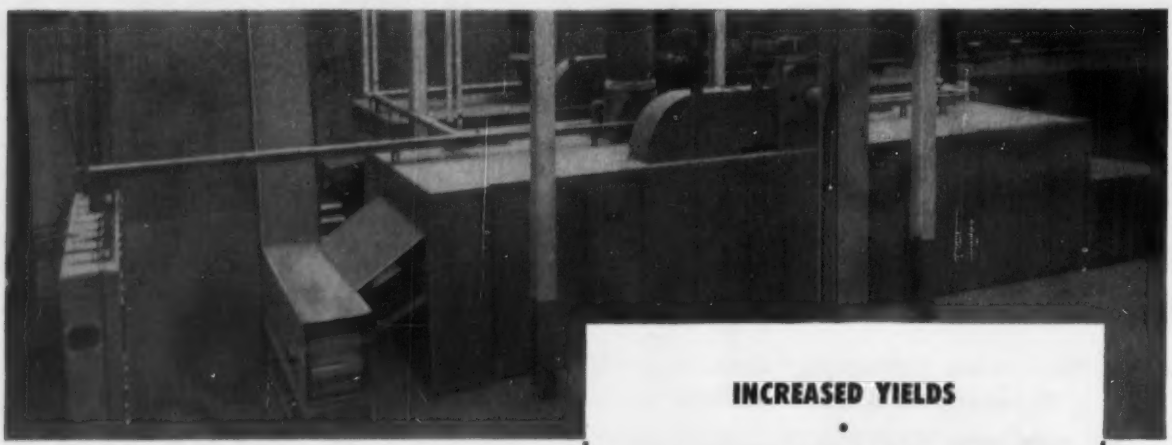
For more data, circle this page number on card at back →

Proctor

DRYING RANGES

for

highest product uniformity!



INCREASED YIELDS

•

GUARANTEED QUALITY OF PRODUCT

•

FLEXIBILITY

•

PROFITABLE OPERATION

PRODUCT UNIFORMITY is of utmost importance to every food processor, at all stages of processing. The Proctor continuous conveyor dryer installation shown above is located in a plant of one of the world's largest food manufacturers—typical of many in use in the food industry today. In this plant Proctor Dryers assure uniformity of color, taste, and high customer appeal—yields are greatly increased!

WITH UNIFORMITY COMES PROFIT. Efficient drying per pound of product can often mean more direct profit than an increased sales volume. Proctor equipment provides the control, flexibility and construction features *essential* to profitable drying performance. Write or phone today for complete information.

OTHER PROCTOR DRYING EQUIPMENT FOR THE FOOD AND PROCESS INDUSTRIES

TRAY DRYERS • TRUCK DRYERS

PRE-FORMING FEEDS • SPRAY DRYERS

PROCTOR & SCHWARTZ, INC.

Philadelphia 20, Pa.

Proctor

MANUFACTURERS OF INDUSTRIAL DRYING EQUIPMENT AND TEXTILE MACHINERY

goes upward. To curb glare, bottoms of fixtures have egg-crate louvers for shielding of direct light.

Open-top design keeps them cleaner for longer periods. When light meter readings show that illumination has dropped from the average of 90 to 60 ft.-candles, fixtures are washed. They are brushed between washings, particularly after dusty production runs.

Group Relamping

Since maintenance costs for a lighting system are cut by group relamping, McCormick replaces all lamps by this system.

Although relatively few are defective when replaced, there are five advantages in changing them all at the same time:

1. **Labor costs are minimized by eliminating a good part of the travel and set-up time needed to replace them individually.**
2. **Since output of a lamp drops as it burns, changing it at a relatively early stage maintains higher illumination—without extra costs for electricity and additional fixtures.**
3. **Plant operations need not be interrupted because a single replacement can be done during vacations or after working hours.**
4. **Auxiliary equipment (starters, ballasts) last longer when lamps are replaced before they burn out.**
5. **Appearance of a lighting system is uniform when all lamps are of the same age.**

Here's how relamping works:

Experience shows that a group of lamps reaches 80% of its average life when about 20% of the lamps have failed. Beyond this point, rate of failure increases rapidly.

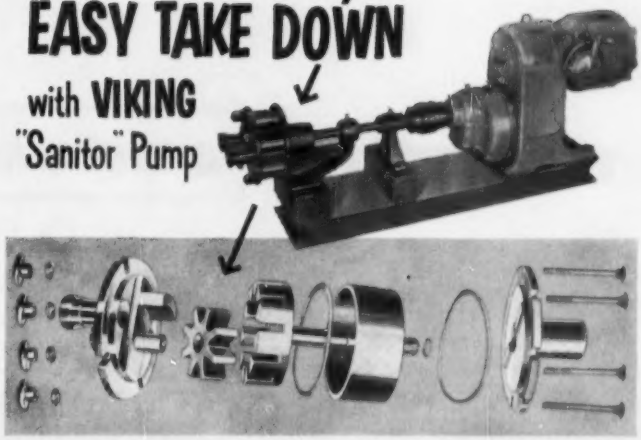
Therefore, when 20% of the lamps have burned out, the entire installation is relamped. Then, 20% of the best replaced lamps are set aside and used as individual replacements in the interim before the next group relamping. Units saved for this purpose are those which appear best from the standpoint of brightness and clean ends.

As lamps fail, they are individually replaced from this stock until it is depleted. At that point, the entire system is again group relamped.

The interval between group relampings usually is determined by striking a compromise between lowest cost per foot-candle and lowest maintenance cost. For plants and office buildings, in which lamps have 2,500-3,000 burning hours per year, relamping about every two years usually is economical and convenient.

End (Resume reading on page 51)

EASY TAKE DOWN
with VIKING "Sanitor" Pump



Every Viking "Sanitor" pump is built in this quick and handy take-down construction. No tools of any kind required, not even for removing the O-ring seal.

It's a simply constructed pump throughout. No timing gears that could cause trouble.

Handiest port arrangement. Pump can be turned on bracket for complete reversal of ports if desired.

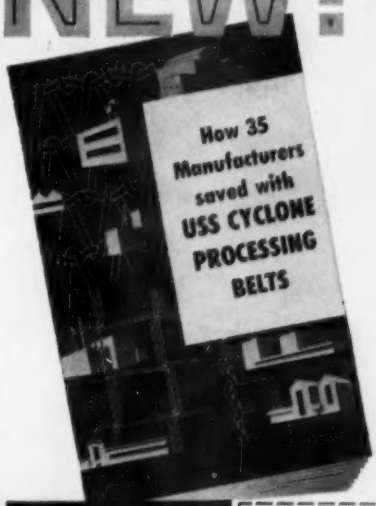
And it's a slow speed, positive displacement pump for smooth accurate flow.

20-35-50-90 GPM—39 models—all 3A approved.

For complete information, request catalog Section Fe today.

VIKING PUMP COMPANY
Cedar Falls, Iowa, U.S.A. In Canada, it's "ROTO-KING" pumps
See our catalog in Sweets

NEW! FREE!



Learn how 35 manufacturers cut costs by using Cyclone Processing Belts. You'll find the whole story in this brand new, free booklet just off the presses. We've carefully selected thirty-five different cases from our files covering many fields of product processing. Chances are, you'll find an example of cost-cutting that could be applied to your own operation. Take advantage of this opportunity to find out how others slashed production costs with Cyclone Belts. Simply fill in and mail the coupon for your free copy of this informative booklet.

CYCLONE FENCE DEPARTMENT
AMERICAN STEEL & WIRE DIVISION
UNITED STATES STEEL CORPORATION
WAUKEGAN, ILLINOIS

USS CYCLONE METAL CONVEYOR BELTS
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for using Atlas food ingredients

Atlas sorbitol and emulsifiers improve taste, texture, keeping qualities—make your products sell better

CANDY conditioned with sorbitol retains its original softness and texture longer. Sorbitol modifies the crystal structure of mixed sugar systems, making cream centers smoother and fondants whiter and lighter.

DIETETIC SOFT DRINKS gain new taste appeal with Atlas sorbitol . . . where it is used for flavor dispersion and bodying purposes. Only a small amount improves "mouth feel," making a big difference in the consumer acceptance of the soft drink.

SHORTENING with Atlas emulsifiers will produce consistently superior cakes, toppings, icings, etc. . . . *all the time.* Atlas emulsifiers have an optimum balance of monoglyceride (imparts excellent cake baking and water absorption properties) and diglycerides (provides additional tolerance . . . assuring consistently superior performance under all conditions).

MANY OTHER FOODS—baked goods, shredded coconut, icings, ice cream, and scores more—are moving off market shelves faster, thanks to quality improvements by Atlas food ingredients.

SORBITOL—Both a superior conditioner and a wholesome food ingredient, helps retain the tender taste and softness of foods containing sugar. Mildly sweet, sorbitol blends well with other ingredients.

ATLAS EMULSIFIERS include bread emulsifiers combining high monoglyceride content with diglyceride "bonus," as well as special emulsifiers for a wide variety of food applications.

Interested? We've helped many manufacturers gain the outstanding advantages of Atlas ingredients . . . and we'd be glad to lend you a hand, too. Write for samples and technical data.

FOOD INDUSTRY DEPARTMENT

ATLAS

CHEMICALS DIVISION
ATLAS POWDER COMPANY
WILMINGTON 99, DELAWARE

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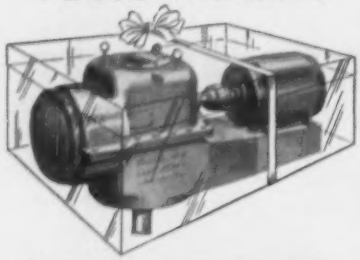
"Packaged" FLUID MIXERS



Gear reducers, motors, motor supports, couplings, shafts, impellers, and base mountings . . . all pre-assembled for quick, easy installation and operation on your tanks.

Philadelphia Mixers offer you more value per dollar

Solve any fluid mixing problem with Philadelphia "packaged" Mixers . . . by standardizing on simple, easily maintained Philadelphia Mixers, you get these advantages:

COMPLETELY INTEGRATED "PACKAGED" SERVICE. Philadelphia designs, and manufactures in one plant, every major component, except motors and bearings . . . Through this controlled, responsible source, you obtain complete solution to your mixing problems.

QUICK-CHANGE GEAR DRIVES. Easily accessible, helical change-gear set allows ready selection up to 14 different standard speeds to meet changing needs. Spiral bevel gears lapped, assembled in matched pairs and micrometer tested for long, quiet operation. All drives A.G.M.A. rated.

FULL RANGE OF SIZES. Choose the Philadelphia Mixer suited to your needs. Six basic models, 1 to 100 HP. Keep in mind Philadelphia can build to sizes and specifications larger than usually available.

UNITARY MECHANICAL SHAFT SEAL. Positive leak-proof shaft seal for closed tank agitation gives long maintenance-free service life. When necessary, it can be installed and replaced in minutes. No special lifting equipment needed.

HEAVY DUTY SHAFTS & BEARINGS. Extra large output shafting results in less shaft deflection at stuffing box or mechanical seal, steady operation of overhung mixer shafts. Bearings oversize, with generous service factor.

Doesn't it stand to reason that these advantages add up to a bigger, better-designed, more powerful unit for your money? Be convinced, just write for Bulletin A-156.

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A-Bombed Foods

—Continued from page 59

some neutrons, except polyethylene film, which showed no irradiation. Mylar became mildly radioactive. Pliofilm, cellophane and Saran-coated cellophane showed higher radiation levels. Radiation in the plastics was about the same as the moderate levels found in tin cans—none came near the high radiation levels found in glass bottles (which dissipated their neutrons quickly, however).

• Significantly, while all foods became "more or less radioactive," no irradiation was transmitted to the food by the container, or vice versa.

• Foods were invariably less radioactive in their natural state than if they contained additives—particularly salt. Salt, exposed to A-bomb neutrons, is likely to retain some radioactivity permanently (though not enough to cause illness), and also becomes yellow. Phosphorus-containing foods showed the highest radio-activity levels—so high and long-lived, in fact, that consumption of these products would be unwise except in an emergency.

Vitamin losses were minimal in most products. And the losses were significantly less in those foods that normally provide the best source for any particular vitamin.

• Flavor and texture changes were often similar to those observed in foods subjected to gamma rays in cold sterilization research. But actually, flavor effects from neutrons absorbed in the A-blast were slight—hardly detectable by expert tasters.

The amount of neutrons to which foods were exposed during the blast was a bare fraction of gamma ray dosages customarily shot through foods in cold sterilization experiments. However, by itself, the quantitative measure means little. That's because gamma rays—having no matter—merely pass through the food and its container, depositing nothing. Neutrons, on the other hand, contain radioactive particles that remain in the exposed products until eliminated by natural dissipation—a process that may take seconds or thousands of years, depending on the radioactive isotope's rate of decay.

• Radioactive fallout, a dust cloud of neutrons and other contaminating radioactive materials (such as cancer-producing strontium-90), did not figure in Operation Teapot's food test experiment. The cloud came to earth many miles from the test site. Thus, the effects of fallout on food supplies remain unmeasured.

End (Resume reading on page 60)

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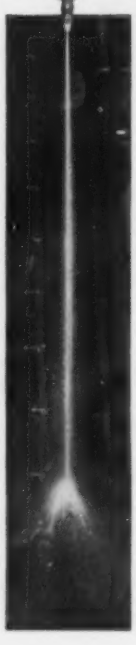
QUICK CLEAN-UP WITH METSO



Metso Cleaner is geared to fast methods. Use Metso in steam gun cleaning. Dissolves quickly, removing oil, grease and proteins. Special component also controls corrosive effect of alkali on metals.

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METSO CLEANERS

PHILADELPHIA QUARTZ COMPANY
1148 Public Ledger Bldg.
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Easy-to-build sub-zero cold room of Armorply helps Duvernoy & Sons meet peak baked-goods demand

Armorply sectional cold room, built by Annapolis Yacht Yard, Annapolis, Md., maintains 25°F with ease throughout the year.

In order to level out production schedules, and yet be prepared for fluctuating daily demand, Duvernoy & Sons, Inc. uses an Armorply sub-zero cold room. In that room, baked goods are kept safely frozen and still are immediately available for delivery.

The cold room – quickly and easily assembled of sections faced with Armorply (metal-faced plywood) – was installed near the shipping area of the plant. With its modular panel construction, the room can easily be expanded, changed in shape or even moved to a new location—with ordinary labor!

Armorply panels are easy to keep clean and can take plenty of day-to-day wear and tear. More important than this low maintenance cost, however, is the fact that the installed cost of an Armorply cold room is comparable to that of ordinary plaster-and-insulation rooms.

Armorply itself is waterproof plywood with stainless steel, aluminum, lead, copper or other metal bonded on one or both sides. Panels are lightweight, vermin-proof, remarkably strong and easy to fabricate. Send coupon for full information and free samples of Armorply. Or see Armorply at any of our 87 offices in major cities.

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use steam efficiently, economically—choose the trap with . . .

top quality...

to keep it on the job

No need for a steam trap to be complicated. All it does is discharge condensate and air from steam lines and equipment. But its importance shouldn't be overlooked. On its effectiveness can rest your economical use of steam . . . the efficiency of your process operations.

A steam trap has to be built to serve long and dependably in severe service—and that's where Nicholson quality counts heavily in terms of performance.

- **One moving part**
- **Positive shutoff—no steam waste**
- **Powerful, intermittent valve action**
- **High capacity—effective use of large orifice**

Specify Nicholson, and be sure.

Write for new Bulletin 10-55

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RECENT INVENTIONS

EQUIPMENT

Poultry Defeatherer Employing Opposed Picking Members, Alternate Ones Simultaneously Movable in Opposite Directions—S. S. Barker and A. W. Sharp, to Barker Poultry Equipment Co., Ottumwa, Iowa. No. 2,743,477. May 1, 1956.

Machine for Coating Apples on Sticks—H. Pikal, Bangor, Mich. No. 2,745,374. May 15, 1956.

Dryer for Powdered Material Having Housing, Gas-Circulating Means, Endless Conveyor, Gas-Permeable Webs That Enclose Product—M. T. Fleming, Wyncote, Pa., to Proctor & Schwartz, Philadelphia. No. 2,746,171. May 22, 1956.

Can-Washing System With Supply Tank, Piping for Controlled Delivery of Wash Liquid Under Pressure—R. E. Farison to Diversey Corp., Chicago. No. 2,746,465. May 22, 1956.

Multiple Bake-Pan Assembly Comprising Spaced Rectangular Pans, Edge-Portion Reinforcing Wire, Bridging Members—J. H. Debs, Chicago, to Chicago Metallic Mfg. Co., Ashland, Ill. No. 2,746,636. May 22, 1956.

Liquid Feeder Consisting of Cylindrical Container, Circular Plate and Disk, Valve, Bottom Discharge—H. F. Swenson, Seattle, Wash. No. 2,746,640. May 22, 1956.

Roaster Employing Housing With End Inlet, Scroll-Shaped Circumferential Wall, Upwardly-Open Discharge, Drum Having Conveying Flights, Air Inlet, Outlet—A. H. Selzer, Evergreen Park, E. G. Berry, Chicago, and R. E. Williams, River Forest to B. F. Gump Co., Cicero, Ill. No. 2,746,736. May 22, 1956.

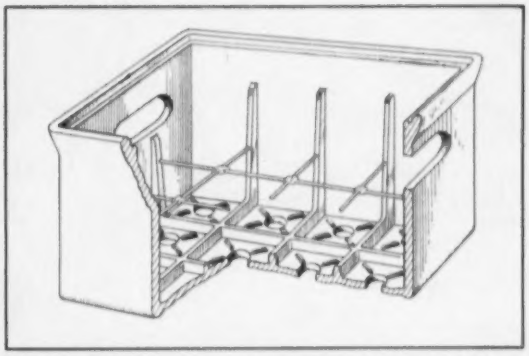
Cheese Extruder Including Chamber, Pressure-Applying Means, Product-Forming Outlet—R. T. Stahl, Homewood, Ill., to Swift & Co., Chicago. No. 2,746,847. May 22, 1956.

Falling-Fruit Retarder Employing Liquid-Containing Tank, Resilient Cushioning Means, Flexible Hood, Delivery Means—J. James, Melvindale, Mich. No. 2,752,926. July 3, 1956.

Bottle Feeder Comprising Horizontal Endless Conveyor, Drive, Curved Ways, Lifting Conveyor—A. C. Davis, Baltimore. No. 2,753,037. July 3, 1956.

Dough Divider Consisting of Chamber With Discharge Device, Dough Receiving and Severing Means, Electronic Controls—D. C. Seem, Zionsville, Pa. No. 2,753,444. July 3, 1956.

Want more information on any of these recent patents—if so, you may obtain detailed printed copies by writing direct to the U. S. Patent Office, Washington, D. C., giving serial numbers of those you want and enclosing 25¢ for each copy.



Molded Milk Case Has One-Piece Design

Novel milk-bottle case has integrally molded bottom, side, and end walls. Low partition elements are formed by up-standing integral ribs that criss-cross the bottom wall. A grid supported above bottom wall provides additional partitioning between bottles.—*W. O. Farrell, Indianapolis, to The Richardson Co., Lockland, Ohio.* No. 2,758,742. Aug. 14, 1956.

Another Engineering Achievement in Packaging Automation

Now . . . YOU CAN PACK YOUR PRODUCT *Automatically!*

QUADNUMATIC

4 MACHINES IN 1

1. CASE OPENER 2. ACCUMULATOR 3. PACKER 4. SEALER

The QUADNUMATIC was designed to fill a long felt need for a single unit to open and form cases, automatically accumulate the case load, inject it into the case, glue and seal.

This all steel pneumatically driven machine is a modern custom engineered unit only 16 feet long.

QUADNUMATIC accumulates any desired pattern in any number of tiers and opens and loads top opening or end opening cases.

Some items now being packed by the Quadnumatic . . .

- CANNED MILK
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- HOUSEHOLD FOIL
- HOUSEHOLD WAX PAPER
- PACKAGED PAPER
- CANS OF PAINT
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NEW COURT AVE., INDUSTRIAL PARK, EAST SYRACUSE, N. Y. BOX 1123, SYRACUSE, N. Y. PHONE 73-6658

Candy Cooker Having Hollow-Tube Agitators With Steam Connection, Staggered Scrapers –E. Revechini to Schuetter Candy Co., Chicago. No. 2,753,158. July 3, 1956.

Shrimp-Eviscerating Unit Consisting of Rotary Table, Synchronized Chuck, Saw, Coordinating Drive and Cam Shaft–T. H. Sloan, Charleroi, Pa. No. 2,753,589. July 10, 1956.

Portable Pinfeather Picker Employing Elongated Cylindrical Hub With Flat-Face Flexible Paddle–O. W. McKendrie to McKendrie Products Co., Klamath Falls, Ore. No. 2,753,590. July 19, 1956.

Slicer for Making Vertical and Horizontal Slits in Bun Clusters–J. R. Shaffer to A. S. Schmidt, Harrisburg, Pa. No. 2,753,907. July 10, 1956.

Fermenter Consisting of Container for Nutrient Solution, Centrally Located Open-Ended Vertical Tube, Bottom Air Inlet, Horizontal Plate, Rotatable Impeller Blade–E. G. Stimpson, Sayville, and H. A. Trebler, Oakdale, to National Daily Research Laboratories, Inc., Oakdale, N. Y. No. 2,750,328. June 12, 1956.

Casing Aid for Sausage Stuffer Consisting of Elongated Elastic Strand With Looped End, Anchoring Means–M. Maier, Valley City, N. Dak. No. 2,754,538. July 17, 1956.

Tomato Peeler Having Rotatable Drum, Helical Slot, Casing, Eccentric Shaft, Helical Grove, Pressurized-Fluid Supply, Synchronizing Means – M. W. Lowe, Connersville, Ind. No. 2,754,749. July 17, 1956.

Corn Sheller and Separator Employing Cylindrical Shell Radial Openings, Rotor–E. P. McCreery, Lakewood, Ohio, to C. O. Bartlett & Snow Co., Cleveland. No. 2,754,827. July 17, 1956.

Automatic Batching Unit With Supply Bin, Weigh Hopper, Discharge Chute, Rapid- and Dribble-Feed Compartments – R. E. Heltzel, Warren, Ohio. No. 2,754,996. July 17, 1956.

Shrimp Separator and Peeler Having Parallel Inclined Rollers Oppositely Rotated, Upper Water Sprays–R. J. Samanie, Houma, La. No. 2,755,501. July 24, 1956.

Ham-Pumping Control Consisting of Scale, Pressure-Responsive Arms, Detectors, Electrical Circuit, Fluid System, Pickle Conduit, Valve–B. T. Hensgen and H. G. Reichel, Chicago, and J. J. Prohaska, La Grange, Ill., to Swift & Co., Chicago. No. 2,755,731. July 24, 1956.

Air-Operated Pickle Pump With Meat-Cut Supporting Member, Injection Needle, Pickle Supply–N. B. Sanderson, St. Joseph, Mo., to Swift & Co., Chicago. No. 2,755,732. July 24, 1956.

Proportioning Pump Employing Primary and Secondary Cylinders, Valve Chambers, Pistons, Synchronizing Means – G. E. Euwe, Brasschaat, Belgium, to Lever Bros. Co., New York City. No. 2,755,739. July 24, 1956.

Confection-Feeding Device Adapted to Upend Horizontal Sandwich Halves for Grouping –L. O. McCullough and R. F. Skinner to Lance, Inc., Charlotte, N. C. No. 2,755,907, July 24, 1956.

Proofer Tray Comprising Flexible Sleeve-Like Member, Elongated Support–F. D. Marasso, to Union Machinery Co., Joliet, Ill. No. 2,755,913. July 24, 1956.

Onion Slicer Having Vertical-Axis Disk, Axial Spindle, Pulley Drive–R. L. Puccinelli to Puccinelli Packing Co., Turlock, Calif. No. 2,755,835. July 24, 1956.

Comminuting Chopper With Feed Chamber Rotatable Feed Screw Having Spiral Rib–J. D. Brown to Toledo Scale Co., Toledo, Ohio. No. 2,755,836. July 24, 1956.

PROCESSES

Inactivating Enzymes in Beet Cossettes Prior to Diffusion by Contacting With Hot Moist Gas–H. S. Owens, Berkeley, Calif., to USA. No. 2,754,233. July 10, 1956.

Degumming Vegetable Oils by Adding Ketene During Water Treatment, Separating Aqueous Gum-Containing Phase – H. Wolff & L. P. Hayes to A. E. Staley Mfg. Co., Decatur, Ill. No. 2,754,309. July 10, 1956.

Inhibiting Deterioration of Fresh Peaches and Apples With Mixture of Triethylene Glycol-Trichloroethane Gases–H. J. Keller, Dunedin, to Brogdex Co., Orange County,

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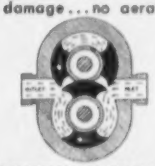
Positive Displacement and Slow Speed—no product damage... no aeration... no agitation.



Corrosion-Resistant—no product contamination, no impairment of flavor.

Sanitary—easy to clean and keep clean, no chance for dangerous bacteria formation.

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Sturdy Construction—designed for long life, a minimum of maintenance.

*Positive Displacement

● The handy Waukesha P. D.* Sanitary Pump is a good friend in any food processing plant. It pumps, easily and effectively, a wide range of food products of many consistencies without damage... without agitation... aeration ... or turbulence—a significant cost-saving advantage for any plant. By not damaging the product's cell structure, the quality and appearance of the food is preserved... satisfies your customers... protects your brand—a real profit maker.

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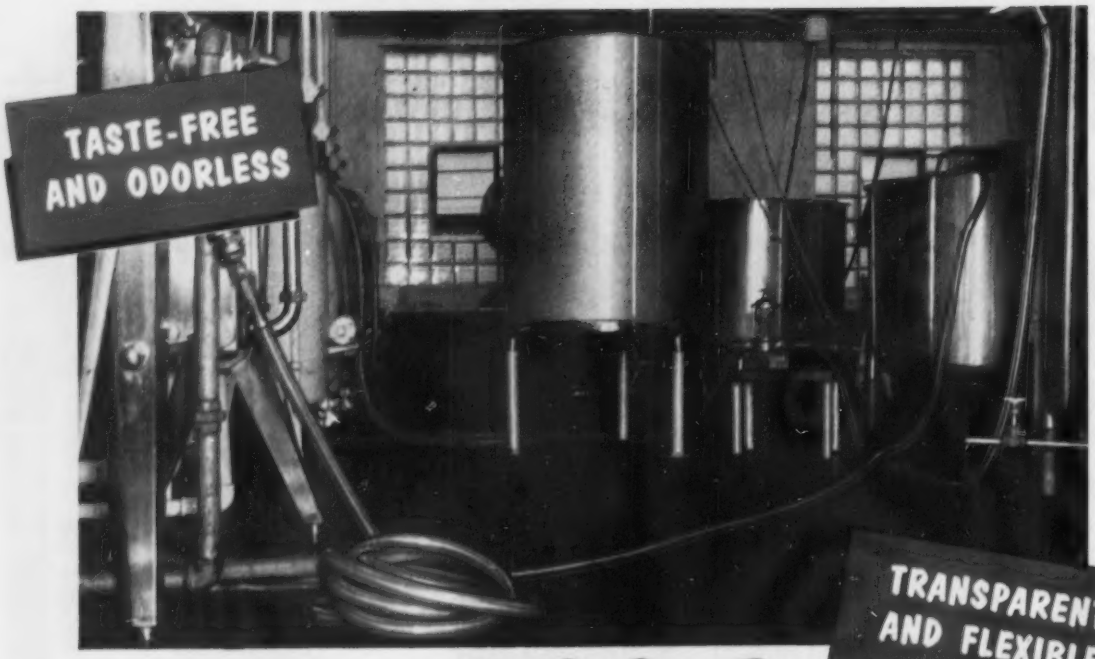

TYGON *B44-3*

food and beverage hose

The Golden Age Beverage Co., Inc., of Akron, Ohio, franchised bottlers and distributors of Pepsi-Cola, use Tygon Formulation B44-3 Transparent Flexible Plastic Tubing extensively in their Pepsi-Cola operation. Liquid sugar and syrups are piped to process vats, prepared mixes are pumped to storage tanks . . . all through 2" i.d. x 2½" o.d. Tygon B44-3 Food and Beverage hose.

Tygon B44-3 Tubing was chosen for this operation because of its many outstanding advantages over other piping mediums. For example, because it is non-contaminating and totally inert to food acids and alkalis, there is no possibility of flavor taint or odor resulting from its use. Its glass-like clarity enables operators to visually check contents at any point.

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Consider for a minute how taste-free, odorless, transparent flexible "piping" can benefit your operation . . .

Send for Bulletin T-97. It's yours for the asking and gives the complete story on Tygon B44-3.

Plastics and Synthetics Division

U. S. STONEWARE
AKRON 9, OHIO

365E

Fla. No. 2,755,188. July 17, 1956.

Treating Fresh Produce for Shipment by Washing, Applying Wax Composition—C. E. Gericke to American Machinery Corp., Orlando, Fla. No. 2,755,189. July 17, 1956.

Canning Fruit Pie Filling by Placing Washed Uncooked Fruit in Can, Exhausting and Adding Aqueous Sucrose Solution Containing Unswelled Starch, Sealing at Atmospheric Pressure, Cooking—J. R. Oyler, Gettysburg, to Knouse Foods Cooperative, Inc., Peach Glen, Pa. No. 2,755,190. July 17, 1956.

Defeathering Fowl by Frictional Blows As Birds Are Tumbled—A. J. Toti, Modesto, Calif., to Honolulu Oil Corp. No. 2,754,539. July 17, 1956.

Preserving Fresh Eggs by Freezing in Shell at Above 22 F., Storing at 22 F. Minimum—C. Hale, G. Ellyn, and C. H. Koonz to Swift & Co., Chicago. No. 2,756,155. July 24, 1956.

PRODUCTS

Molecularly Modified Lard by Continuously Passing Reaction Mixture (Spent Catalyst and Undesirable Side Products) to Mixing Zone, Adding Hot Water, Agitating, Passing Emulsion to Heating Zone, Separating Aqueous Phase—R. W. Bates, C. J. Davis, Jr., and C. E. Morris to Swift & Co., Chicago. No. 2,751,304. June 19, 1956.

Concentrated Fruit Puree by Partially Dehydrating Non-Sulphited Whole Fruit, Pulping. Stabilizing—W. F. Talburt, Berkeley, and M. J. Powers, Lafayette, Calif., to USA. No. 2,752,253. June 26, 1956.

Antioxidant Prepared by Drying Osage Orange Fruit, Solvent-Extracting, Recovering — J. R. Clopton, Boulder, Colo., to Texas Research Foundation, Renner, Tex. No. 2,752,314. June 26, 1956.

Strained Meat Product by Comminuting Moistened Meat, Heating, Filling, Cooking—L. R. Hawk and D. Eolkin, San Lorenzo, Calif., to Gerber Products Co., Fremont, Mich. No. 2,753,269. July 3, 1956.

Edible Spread From Vegetable Oil, Comprising Glyceride Oil, Fat-Acid Monoglyceride, Phosphatide—E. P. Jones and E. B. Lancaster, Peoria, Ill., to USA. No. 2,754,213. July 10, 1956.

Low-Ester Pectinic Acid by Separating Citrus Peel From Juice and Seeds, Comminuting, Washing, Adjusting Peel pH for Enzyme Activity, Converting Pectic Substances, Washing, Decolorizing—H. T. Leo and C. C. Taylor, Anaheim, Calif. No. 2,754,214. July 10, 1956.

Stabilized Flavoring by Emulsifying Volatile Essential Oils in Mixture of Edible Non-Aqueous Liquid Carrier and Protein —J. W. Evans, Highland, Ind., and A. W. Kleinschmidt, Crete, Ill. to American Maize-Products Co. No. 2,754,215. July 10, 1956.

Metal Deactivator Consisting of 2-(2-Hydroxyphenyl) Imidazole—J. A. Chenicek, Bensenville, to Universal Oil Products Co., Des Plaines, Ill. No. 2,754,216. July 10, 1956.

Fire-Retardant Paint Comprising Pigment, Volatile and Non-Volatile Vehicles—A. O. Allen, E. Orange, T. M. Murray, Morris Plains, and S. P. Liberti, Totowa, N. J., to Vita-Var Corp., Newark, N. J. No. 2,754,217. July 10, 1956.

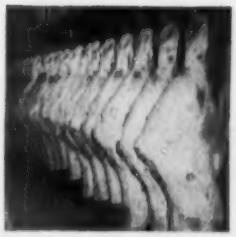
Modified Starches Made by Adding Water-Soluble Salt to Reaction Mixture of Starch, Chloride—H. L. Wetzstein, Lake View, Iowa and P. Lyon, Chicago to American Maize-Products Co. No. 2,754,232. July 10, 1956.

Bactericidal Clear Ice Having 0.1% Active Agents — A. Schmitz to Th. Goldschmidt A.G., Essen, Germany. No. 2,755,191. July 17, 1956.

Apple Pies Made by Soaking and Draining Dried Fruit, Cooking in Crust Pie, Preparing Juice Consisting of Drained Water, Sugar, Thickening Agent, and Spice, Cooking to Thick Clear Syrup, Adding to Baked Pie—M. B. Strause, San Diego, Calif. No. 2,756,152. July 24, 1956.

Ice Cream Processed by Freezing Mix While Agitating, Hardfreezing, Kneading, Holding at Below —20 F.—J. W. Eyestone, Aberdeen, S. Dak. No. 2,756,153. July 24, 1956.

Dried Buttermilk Prepared by Standardizing Fat and Lecithin Content of Stored Liquid, Condensing at Below 163 F., Dry-



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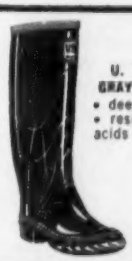
• Heavy duty • Fully vulcanized double-coated white or black neoprene • neck loop • hemmed edges • size 33" x 45"

U. S. PEERLESS NEOPRENE SUIT
• Neoprene coating outside and inside • full-length jacket • corduroy-tip collar • bib-front overalls • black, olive drab or safety yellow



U. S. BUTYLAC GRAY SHORT BOOT
• deep-cleated sole • resists fats, oils, acids

US ROYAL FOOTWEAR

NEOPRENE SHORT BOOT
• duck lined • "Shockproof" cushion sole • cleated sole and heel

Sold only through industrial and retail stores

U. S. INDUSTRIAL RAYNSTERS®
U. S. ROYAL RUBBER FOOTWEAR

US RUBBER United States Rubber

Rockefeller Center, New York 20, N. Y.

how 4 Fishermen made a big haul with Ac'cent

The Fulham Brothers beam as sales of 4 Fishermen pre-cooked frozen fishsticks continue their upward surge. Sales are up 85% since 1954.

Packaged and ready for market! Processors of both canned and frozen foods have found that Ac'cent gives their products a competitive edge on flavor.

Business up 85% in 2 years!

THE four smiling faces on the 4 Fishermen package are reflected many times in the sales department of Fulham Brothers, of Boston and Portland. Sales of their frozen fishsticks have been climbing in an amazing fashion since their introduction in 1954.

One contributing reason is the use of Ac'cent, to build and hold flavor in the cod and haddock. Fulham Brothers buys prepared batter and breading containing Ac'cent. They also add 4 ounces of Ac'cent to every 18 pounds of batter to insure consumers of the finest flavor and to promote repeat business for 4 Fishermen.

Hundreds of leading food processors use Ac'cent to heighten and hold true food flavors, and to guard against flavor loss in packing, shipping and storage.

Isn't the precious flavor of *your* products worth protecting with Ac'cent? Ac'cent technical representatives will aid you in determining the amount best suited for your product. Call or write today to

Ac'cent® *Remember flavor builds your business, and Ac'cent builds flavor!*

BRAND
Pure Monosodium Glutamate
AC'CENT • INTERNATIONAL, 20 N. Wacker Drive, Chicago 6, Illinois

ing—A. P. and F. P. Zepp, Fountain City, and C. J. Zepp, Alma, Wis. No. 2,757,092. July 31, 1956.

PACKAGING

Packaging Pie-Crust Dough in Water-and-Grease Impervious Sheet, Helically Wrapping, Inserting Into Cylindrical Casing, Bonding Flattened End Convolutions—S. A. Ayres, Hermos Beach, Calif. No. 2,745,753. May 15, 1956.

Oleo-Mixing Package Consisting of Flexible Wrapper, Slit for Adding Solid Coloring Material, Flexible Sealing Tab—R. S. Steinbock, Sarnias, Ont., Canada, to Hammock Package Ltd. No. 2,745,754. May 15, 1956.

Fill Detector for Cardboard Carton Including Oscillating Guide, Rotating Crank, Probe Arm—H. E. Engleson, Chicago, and E. A. Hartbauer, Des Plaines, Ill., to F. B. Redington Co., Chicago. No. 2,746,222. May 22, 1956.

Bottle Caser Employing Rotary Table, Trays, Case-Supporting Surface, Actuating Means—A. Donald, Woodside, and L. McGihon, San Leandro, Calif., to A. R. Silva, San Jose, Calif. No. 2,746,226. May 22, 1956.

Marking Device Having Cylindrical Drum, Article-Contacting Mechanism, Oscillating Arm, Stop Means—I. S. Gottscho, Milburn, to Adolph Gottscho, Inc., Hillside, N. J. No. 2,746,380. May 22, 1956.

Automatic Case Loader Comprising Single-File Article Feeder, Empty-Case Conveyor, Pusher Plate, Transfer Means—W. M. Thompson, A. G. Swift., Jr., and A. T. Roberts, Jr., Cordell, Ga., to Dacam Corp., Charlotte, N. C. No. 2,746,662. May 22, 1956.

Hermatic Container Closure Consisting of Pre-Formed Plastic Ring, Moisture- and Grease-Resistant Paperboard Disk—G. A. Moore, New York City. No. 2,746,669. May 22, 1956.

Bacon Holder Made From Rectangular Blank, Having Bottom Panel, Narrow End Walls, Flaps, Longitudinal Score Lines—W. A. Ringler, Wayne, Pa., to Gardner Board & Carton Co., Middletown, Ohio. No. 2,753,107. July 3, 1956.

Inhibiting Mold Growth on Packaged Cheese by Flushing Wrapped Product With CO_2, Evacuating, Sealing Under Vacuum—J. D. Ingle, Chicago, and A. N. Nawrocki, Curwensville, Pa., to Swift & Co., Chicago. No. 2,753,268. July 3, 1956.

Bag Filler Employing Spout, Conical Bag-Opening Crown, Tightening Band—G. Orstrom, Kungsangen, and H. Ortmark, Alsten to Arenco Aktiebolaget, Stockholm, Sweden. No. 2,754,646. July 17, 1956.

Transfer Wheel, for Stacking Packages From Conveyor, Having Spaced Arms, Release Mechanism—C. J. Malhiot, Oak Park, to F. B. Redington Co., Chicago. No. 2,754,980. July 17, 1956.

Solids Filler Having Means for Volumetric Dispensing, Check-weighing and Adjusting Feed, Agitating—M. Knobel, Boston, to Pneumatic Scale Corp., Ltd., Quincy, Mass. No. 2,755,007. July 17, 1956.

No Can-No Cover Feed Control Employing Magnetic Switch Responsive to Gap in Can Line—L. F. Glowen and J. J. Sennello, Chicago, to Continental Can Co., New York City. Nos. 2,755,762-763. July 24, 1956.

Egg Carton of Cellular Paperboard Employing Longitudinal Creased Hinge Zone and Cross Partitions Forming Outwardly Convex Spaced Cells—R. F. Reifers, Chicago, to Diamond Match Co., New York City. No. 2,755,984. July 24, 1956.

Plastic Package for Fluids Having Rectangular Heat-Sealed Walls, Enlarged Side Seam Areas to Prevent Rupture of Vertical Seams—R. A. Mahaffy, Cedar Grove, N. J., to Standard Packaging Corp., New York City. No. 2,756,154. July 24, 1956.

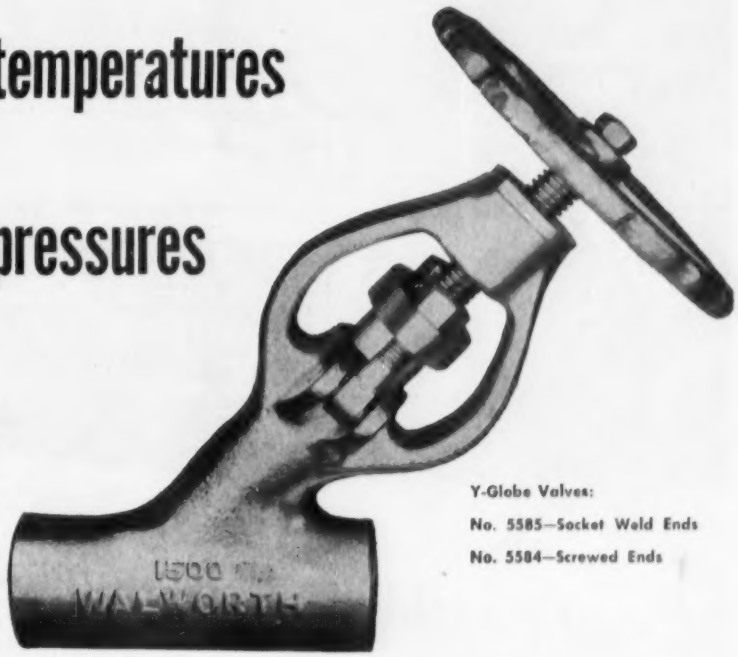
Package-Handling Unit Employing Empty Carton and Package Conveyors, Stationery Guides—J. L. Ferguson and R. C. Talbot, to J. L. Ferguson Co., Joliet, Ill. No. 2,756,553. July 31, 1956.

Paperboard Bottle Carrier With Integral Partitions Formed From One-Piece Center Ply—P. C. Collura, Auburndale, Mass., to Container Corp. of America, Chicago. No. 2,756,900. July 31, 1956.

Walworth's NEW small cast steel valves

SERIES 1500 – SIZES ¼ to 2 inches

handle HIGH temperatures
HIGH pressures



Y-Globe Valves:
No. 5585—Socket Weld Ends
No. 5584—Screwed Ends

Walworth is proud to make these new Small Cast Steel Valves available to power stations . . . oil refineries . . . ships . . . wherever piping is subject to severe pressures and temperatures. Non-shock service ratings of these valves: 1500 psi–950F for steam; 3600 psi–100F for water, oil or gas. Cast of chromium molybdenum steel, they are compact and light, yet exceptionally strong. Both Y-Globe and Angle type valves are available.

Angle Valves:
No. 5587—
Socket Weld End
No. 5586—
Screwed End

Simplified Walworth design eliminates many of the valve problems encountered in high pressure service. Among the features of this new valve are:

INTEGRAL BODY AND YOKE – made from a single casting without threading or welding. Bonnet joint — always a potential source of leakage — is eliminated. Valves can be reassembled quickly and easily.

ROTATING DISC – prevents valve seat distortion and consequent leakage. Cuts down replacements.

WELDED SEAT RING – compensates for changes in pressure and temperature—eliminates a major source of leakage.

SPECIAL BACK SEAT BUSHING – permits repacking the valve under pressure with greater safety.

PACKING CHAMBER – designed to dissipate heat thus keeping packing rings at lower temperatures—gives them longer life.

These valves are available with either socket weld ends or screwed ends, in sizes ranging from ¼ to 2 inches. For further information on Walworth series 1500 Small Cast Steel Valves, see your local Walworth distributor, or write for Circular No. 134.

WALWORTH

valves • fittings • pipe wrenches

60 EAST 42nd STREET, NEW YORK 17, N. Y.

For more data, circle this page number on card at back →

LOW VOLTAGE CONNECTION DIAGRAM
INDUCTION MOTOR
HIGH VOLTAGE CONNECTION DIAGRAM
LOW VOLT CONN.
HIGH VOLT CONN.
SERIAL NO 2242224
TYPE C0GX 215 FRAME
H.P. 5 1750 R.P.M.
VOLTS 220/440 3 PHASE
CYCLES 60 1.15 SERVICE FACTOR
°C RISE 40 CONT DUTY
FRONT BEARING SIZE
FRONT BEARING 205KD 307KD SHAFT EXT. BEARING
SHAFT EXTENSION BEARING SIZE
CODE G B NEMA DESIGN
AMPS. 14/7 C312 OPERATING INSTRUCTIONS
OPERATING INSTRUCTIONS
CURRENT OPERATION AT 208 VOLTS
220 - VOLT MOTORS ARE USABLE ON 208 - VOLT NETWORK SYSTEMS
CURRENT AT 208 VOLTS 14.3 AMPS.
THE LOUIS ALLIS CO.
MILWAUKEE, WIS., U.S.A.
DIAG. # 364
110904

why is this nameplate important to you?

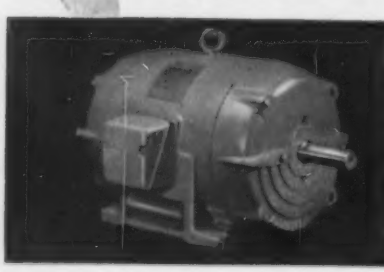
It provides visible evidence that Louis Allis standard motors are built with special care to run better, last longer . . .

Look at the information on this nameplate—information that makes life a lot easier for the user. And to keep this information available at all times, we make this nameplate out of corrosion-resistant stainless steel.

Yes, in the new LA line of standard motors, even the nameplate gets special attention from our engineers. And here's what it means to you:

- The rerated frame size shown means more horsepower from motors with smaller outside dimensions. Performance has been improved by new materials and manufacturing methods.
- Spare bearings can be easily ordered from bearing size and type designations on nameplate, thus eliminating disassembly of motor to determine bearing size. Bearings used are conservatively rated for long life.
- No more lost connection diagram since this information is simply and clearly shown on nameplate. This combined with permanent lead markings, assures that correct motor connections can always be made.
- 220/440 volt motors are suitable for operation on 208 volt systems and full load current for 208 volt operation is included on the nameplate. This eliminates need for original equipment manufacturers to carry a stock of 208 volt motors.

Because they are built with special care, new LA standard motors can do a lot more for you. New bulletin No. 1700 shows you why—just write for your copy.



A complete line of standard rerated motors in frames 182 through 326U now in stock. Special rerated motors are available on short delivery.

LA-106

THE LOUIS ALLIS CO.
MILWAUKEE 7, WISCONSIN

MEN & COMPANIES

Industry

Borden Co. has started construction of a modern biscuit plant at East Point, Ga., for its cheese division. Also, the food products division plans a $1 million research center in Syracuse, N. Y.

Bohemian Brewery Corp., Los Angeles, reports purchase of Schneider brewery at Trinidad, Colo.

BiB Corp. announces it will combine with **Sasson-King, Inc.,** Lakeland, Fla., to form one company under the name of the BiB Corp.

Dickinson Family, Portland, Ore., makers of preserves, have embarked on a $350,000 plant and expansion program.

Dole Hawaiian Pineapple Co. Ltd., announces centralization of all sales activities and personnel at its San Jose, Calif., offices.

Freeman Certi-Fresh Foods, Los Angeles, has opened a new separate building for producing its fish sticks.

Golden Grain Macaroni Co., Inc., Seattle, announces its purchase of Mission Macaroni Co., Seattle.

Hawley & Hoops, Inc. reports it has become a division of Food Manufacturers, Inc., and will now be known as M&M's Candies.

Peter Pan Bakers, Omaha, Neb., plans to construct a new electronically controlled bakery at a cost of approximately $2 million.

Pepsi-Cola Co. is starting construction on a new $1½ million bottling plant in Brooklyn.

Rochester Dairy Coop., Rochester, Minn., will build a Grade "A" milk processing plant.

Red Dot Foods, Inc. has acquired George Hogue Mercantile Co., Kansas City, Mo., Plezall Cookie Co., Inc., Chicago, and Wright's Potato Chip Co., Dodge City, Kans.

Savoy Foods, Inc., Chicago, announces that it has awarded an exclusive distribution franchise for its Savoy Food brand to Dearborn-Economy Wholesale Grocers.

Personnel

James W. Alego has been appointed gen. manager of the new Green Giant Co. manufacturing plant at Savage, Minn.

Keith Agnew is new pres. and gen. manager of Stokely-Van Camp of Canada Ltd.

James Bergman, Jr., has been elected to board of River Brand Rice Mills, Inc.

George E. Clausen, Sr., has resigned as pres. of Gentry, division of Consolidated Foods Corp. He is succeeded by Dr. Arthur N. Prater.

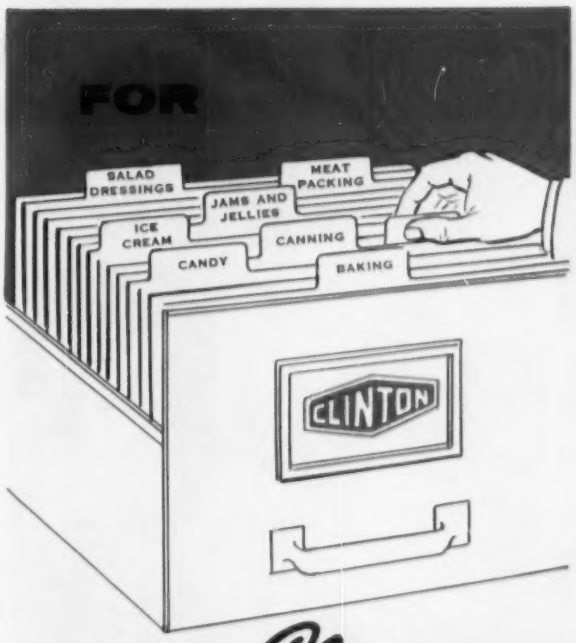
Dr. Conrad A. Elvehjem, Dean of Graduate School, Univ. of Wis., has been named 1956 recipient of Charles F. Spencer Award for meritorious contribution to field of agriculture and food chemistry.

Dr. Paul J. Flory, Cornell University, has been chosen to head Mellon Institute's Investigational activities as Exec. Dir. of Research.

Lawrence L. Frank and **Lloyd C. Mitchell** have been elected to the board of General Baking Co.

Dr. Donald H. Hale has joined the central engineering dept. of Food Machinery & Chemical Corp., San Jose, Calif.

W. Parlin Lillard has been elected v.-p. of General Foods Corp. He will also serve as gen. manager of the newly created Perkins Div.



PICK *Clinton*®

CORN STARCH . . .
. . . CORN SYRUP
. . . REFINED CORN OIL
. . . DEXTROSE

Among food processors using Clinton products, you'll find them all — canner, packer and baker . . . brewer, candy and ice cream maker.

All these food processors have one thing in common: They know that *quality* processing requires *quality* ingredients. For many years, Clinton has had a reputation for producing the very best in dextrose (Clintose), corn starches, corn syrups and refined corn oil for the food industry.

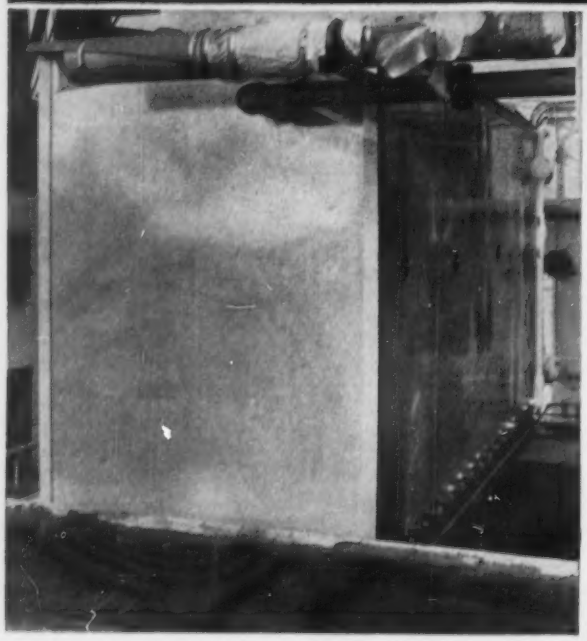
That's why our customer files hold some of the best-known food names in America. If *your* name's not there, it ought to be! Can we get together soon?

and remember : technical service in connection with your specific problems is available upon request.

Quality products
FROM THE WORLD'S CORN CENTER
CLINTON
CLINTON CORN PROCESSING COMPANY
CLINTON, IOWA

For more data, circle this page number on card at back →

The "KING ZEERO" Recirculated Ice Water System



Last one of 4 "King Zeero" units installed on ramp at Ira Wilson & Son dairy, Detroit, Mich.

GIVES YOU SPEEDY PRODUCT COOLING -- 32°-34° COLD ICE WATER

REQUIRES NO MECHANICAL AGITATOR

Permanent louvres act as non-mechanical agitators-no moving parts to service or upkeep costs

The simplicity of "King Zeero's" operation makes for efficient and trouble-free operation. Tons of ice are built-up daily on the coils during the off-peak hours. This chills circulating water to provide an ample supply of 32°-34° ice water, or lower temperature brine, for all plant needs.

Operation is entirely automatic, The "King Zeero" is economical to operate—profitable to own.

THE KING ZEERO COMPANY
4300-14 W. MONTROSE AVE., CHICAGO 41, ILL.

THE SPRAY NOZZLES You Need

You'll find the nozzle to meet your specific requirements in the complete selection offered by Delavan . . . one of the world's leading producers of high quality precision nozzles.

Write for
CATALOG 32
Gives complete details and specifications on the complete Delavan line of industrial spray nozzles.

DELAVAN *Manufacturing Co.*
West Des Moines, Iowa

STOP GUESSING START SAVING!

$65

TIME-RECORDER + TOTALIZER

gives complete production data continuously . . . automatically

Now get complete, accurate, documented production data on any machine, process, operation. Eliminates costly, inaccurate spot-checks, time studies.

TR+T records on continuous 4-month tape. Uses no ink. No maintenance. Thousands in use in large and small plants.

- Chronologically records actual on-and-off time by duration.
- Gives absolute time-study data per operation.
- Establishes true cost accounting.
- Permits supervision of parts replacement, repairs, maintenance.
- Gives total operating time of machine, feed or belt-line.
- Allows ability to anticipate equipment servicing.

STANDARD INSTRUMENT CORP.
DIVISION OF HEAT-TIMER CORPORATION
657 BROADWAY • NEW YORK 12, N. Y.

Dr. Edmund H. Hamann, chief flavor chemist for Fritzsche Brothers, Inc., will retire from active service as of Jan. 1.

Harry R. Hambleton has been named v.-p. of operations in Mexico for Pepsi Cola International.

Fred R. Haviland, Jr., has been named to newly created post of dir. of business planning for Anheuser-Busch, Inc., St. Louis.

Alfred Iddles, pres. of Babcock & Wilcox Co., has been elected pres. of Atomic Industrial Forum, Inc., for the forthcoming year.

Kenneth E. Ketzel has been appointed dir. of transportation for Consolidated Foods Corp.

John M. Krno has been appointed manager of bulk sales and development for Corn Products Refining Co.

Charles W. Lubin, pres., the Kitchens of Sara Lee, is now director of Consolidated Foods Corp., with which former company has merged.

G. Stanley McKenzie has announced his retirement as v.-p. and district mgr., Calif. and Hawaii, for Beatrice Foods Co., Chicago.

Spencer S. Meilstrup has been elected v.-p. of Diamond Crystal Salt Co.

Charles G. Mortimer, pres., General Foods Corp., has been named winner of Printers' Ink Advertising Award for 1956.

Harry Rose and **Peter Mitchell** have been elected v.-p.'s for E. A. Aaron & Bros., a division of Consolidated Foods Corp.

John D. Scott is new v.-p. in charge of sales, and **Ross E. Jones** is v.-p. in charge of distribution for H. J. Heinz Co.

Lester Smith, board chairman of Dairy Corp. of America, has been elected pres. of the Ice Cream Manufacturers of New York State.

Dr. George W. Shadwick, George Reeder and **Claude Harper** have been appointed dir. of foreign service dept., dir. of milk and ice cream quality control, and dir. of butter quality control, respectively, for Beatrice Foods Co., Chicago.

Alfred J. Stokely is new exec. v.-p. and board director of Stokely-Van Camp, Inc., Indianapolis.

Associated Industries

Advance Oven Co., St. Louis, has elected Maurice Rottersmann pres.

Alloy Steel Products Co., Inc., announces appointment of Harold C. Templeton as chief metallurgist.

American Can Co. announces purchase of Bradley Container Corp., Maynard, Mass., and plans to construct new can plant in San Antonio, Tex.

American Machine & Foundry Co. announces the appointment of J. J. Cranmore as gen. mgr. of Lowerator Div.

Ben-Hur Mfg. Co., Milwaukee, has organized a new food service division under direction of E. F. Jackson, v.-p. and gen. sales manager.

Borg-Warner Corp., Chicago, announces appointment of G. W. Kelch as pres. of the recently acquired Ingersoll-Humphryes div.

Brooks Rotameter Co., Lansdale, Pa., has appointed Robert F. Gilman production engineer.

Crescent Metal Products, Inc., announces appointment of Richard J. Brown as chief engineer.

Caspers Tin Plate Co. is negotiating for the acquisition of Olive Can Co., Chicago.

Cornwall Canning Co. is erecting a new plant at Magrath, Alberta, Canada.

Crown Zellerbach Corp., San Francisco, announces retirement of Alexander R. Heron as v.-p. for industrial and public relations.

Diaphane Corp., Philadelphia announces the appointment of John Cozza as v.-p. in charge of sales.

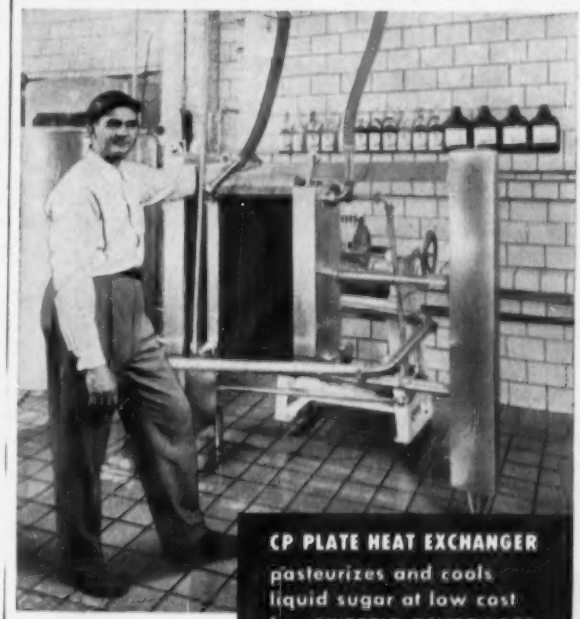
Evans Research and Development Corp., N.Y.C., announces the election of C. Edgar Chamberlain and Ralph L. Evans Jr. to the board.

Exact Weight Scale Co., Columbus, Ohio, appoints John D. Beeson plant mgr. of mechanical div.

Glass Container Manufacturers Institute, Inc., announces

"Gives us a fine product, and consistent quality with hardly any maintenance."

Jack Levin, Sweetie Beverages Philadelphia



"Our CP Plate Unit does a fine job *all the time* pasteurizing and cooling about 300 gallons of liquid sugar per hour. The syrup is heated from room temperature to 190°F. and then cooled to 70°F. in the second section. It helps us get a more uniform product and saves us considerable time and work compared to the bag and steam kettle method. We have hardly any maintenance with the Plate Unit. It has met all our expectations."

This comment by Mr. Levin sums up nicely some of the reasons why so many plants select CP plate heat exchange equipment. If you heat, cool, regenerate or HTST pasteurize any free flowing liquid food product, you can't do better than check into the advantages CP can offer you—in efficiency, economy and product protection. Write on your letterhead for full particulars.

THE *Creamery Package* MFG. COMPANY
General and Export Offices:
1243 W. Washington Blvd.,
Chicago 7, Ill.

THE MARK OF DISTINCTION IN DAIRY PROCESSING EQUIPMENT

Sales Branches in 23 Principal Cities

election of William J. Green, exec. v.-p. Thatcher Glass Mfg. Co., Inc., to the board of trustees.

Hazel-Atlas Glass Co., Wheeling, W. Va., announces its acquisition by Continental Can Co., Inc. Hereafter its business will be carried on under the name of Hazel-Atlas Glass Div. of Continental Can.

Hoerner Boxes, Inc., Keokuk, Iowa, will elect a new pres. Nominee is W. W. Jackson.

Infilco Inc. has named E. G. Kominek and A. A. Kalinske to the position of v.-p.

Joseph T. Ryerson & Son, Inc. has opened its new stainless steel-sheathed South Plant in Jersey City, N. J., increasing its capacity 50%. The enlarged facility now has approximately 355,000 sq. ft. devoted to metal servicing. Company also announces appointment of William J. Cleary as manager of tubular steel products at Philadelphia plant.

Kendall Co., Chicago, announces that it has started construction on a new $1,300,000 plant in Franklin, Ky. This plant will produce Polyken industrial tapes, plastic film, and plastic specialties.

Milliken Products, Inc., Madeira, Ohio, announces that it has been purchased by Paper-Package Co., Indianapolis.

Minneapolis-Honeywell Regulator Co. announces plans for construction of a new three acre manufacturing plant and home office at Fort Washington, Pa.

Package Designers Council has opened new executive offices at 271 Madison Ave., New York City, with Glenn Mather as Exec. Sec. It has also named Francis E. Blod, Design Associates Ltd., pres.

Packaging Machinery Manufacturers Inst. has elected W. B. Bronander, Scandia Mfg. Co., pres., and J. H. Richmond, Potdevin Machine Co., exec. v.-p.

Pfaudler Co., Rochester, and **Arteacero, S. A.,** Mexico, D. F., jointly announce establishment of Arteacero-Pfaudler, S. A., Mexico. The association will serve the Mexican market for industrial processing equipment and technical services.

Pneumatic Scale Corp., Ltd., Quincy, Mass., has elected Kendall D. Doble, Jr., exec. v.-p.

Read Standard Corp., York, Pa., announces its approval of a conditional agreement to merge with **Capitol Products Corp.,** Mechanicsburg, Pa.

Standard Steel Corp., Los Angeles, announces the advancement of Walter J. Kalmeyer to v.-p. and Clay C. Hopper to asst. gen. manager.

Towmotor Corp., Cleveland, announces the acquisition of Gerlinger Carrier Co., Dallas.

Trane Company, La Crosse, Wisc., announces plans to double present research and testing facilities, and to construct two new manufacturing plants.

York Farms Ltd., Toronto, has appointed David E. Leckie production mgr. for its western div.

Deaths

Clarence Birdseye, 69, pres. of Process Evaluation & Development Corp., and noted inventor. (Also see News Section.)

H. E. Hodgson, 69, pres. and founder of Hodgson & Co., Ltd., and controller of edible molasses during W. W. II.

Dr. Henry Reist Kraybill, 65, noted scientist and educator.

N. Laurie Shaw, 53, sec.-treas. of Shaw Dairies Ltd., Ottawa.

Frederick Walton St. Lawrence, 69, retired v.-p. George Weston Ltd.

Mervin Watson, 60, sales mgr. of Eastman Gelatin Corp., Peabody, Mass.

Edward E. Willkie, 60, pres. of Pacific American Fisheries, Bellingham, Wash.

Make new PROFITS from unused overhead space while processing your products under exact time, temperature, and atmospheric control . . . with a Greer MULTI-TIER.

Converts heating, cooling, drying, and freezing operations from batch to continuous processing. In one application alone, MULTI-TIERS have boosted production 7 times per man, in ¼th the floor space.

- **Saves floor space—ideal wherever long "in process" travel required.**
- **Multi-Tier trays convey products through *controlled* processing cycles of 10 minutes to 24 hours without jar or jolt. Products remain on trays during entire process.**
- **Saves labor. Automatic or manual loading and unloading.**

FREE
Write for informative 8-page Bulletin 55-12

J. W. GREER COMPANY

Wilmington, Massachusetts

Sales Engineering Offices: Chicago, Ill., and San Francisco, Calif.

GREER

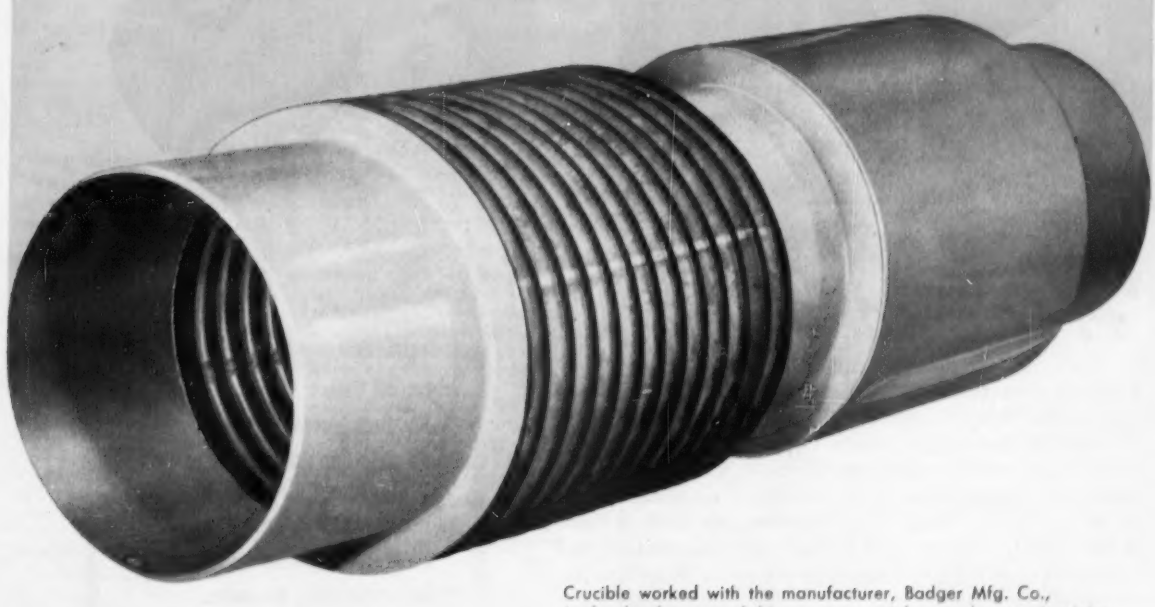
STAINLESS fights corrosion, temperature and fatigue *in this* double expansion joint

This is a two-element expansion joint used in power, heating, industrial and process applications. Its job is control of thermal expansion in pipelines. And it's constantly exposed to the triple-hazards of corrosion, high pressures and temperatures.

These are good reasons why its maker, Badger Mfg. Co., Cambridge, Mass., found Crucible type 321 stainless steel sheet their best choice. For Crucible stainless is easy to fabricate, has good physical properties, and is exceptionally resistant to corrosion and heat.

Consider the advantages of stainless for *your* products. For more details see your local Crucible representative. He'll be happy to supply technical data, or arrange for prompt delivery of the steels you need.

Crucible Steel Company of America,
The Oliver Building, Mellon Square,
Pittsburgh 22, Pa.



Crucible worked with the manufacturer, Badger Mfg. Co., in the development of this new-type stainless steel expansion joint. Made from a single tube, its maximum diameter approximates that of ordinary flanged fittings.

CRUCIBLE first name in special purpose steels

Crucible Steel Company of America

Canadian Distributor — Railway & Power Engineering Corp., Ltd.

For more data, circle this page number on card at back →

Nash Instrument Air Compressors deliver only clean air, free from oil or dust, and without filters

Here is Why!

You can dispense with oil filters and dust filters when you install ®Nash® Clean Air Compressors. You can save the cost of maintaining these devices. You can greatly reduce instrument maintenance costs. For the Nash employs no internal lubrication, therefore no troublesome oil is in the delivered air. Moreover, air from a Nash is thoroughly washed and cooled as it passes thru the pump. Dust in the plant atmosphere, even fly ash, is immediately removed.

®Nash® Clean Air Compressors are simple, with only one moving element. No valves, gears, pistons, sliding vanes, or other enemies of long life and constant performance complicate a Nash. No aftercoolers are needed. You will find it profitable to investigate these pumps, now.

No oil filters.
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Rubber Doors

Gives construction advantages of a series of swing-type insulated rubber doors for installation in heavy traffic areas. Units available in a wide range of colors for mounting in wood, steel, and masonry jambs. 4p.—*Sti-Klip Mfg. Co. Inc., Cambridge, Mass. (233A)*

Speed Reducers

Pictures wide line of gear motors for speed reduction. Detailed cutaway drawing shows construction. Bulletin E-2408, 8p.—*Reliance Electric & Engineering Co., Cleveland. (233B)*

Vertical Turbine Pump

Giant cutaway view shows all construction features of a vertical, turbine-type pump used in well-water supply systems. Available capacities range from 20 to 10,000 gpm. Bulletin 600, 4p.—*Layne & Bowler Pump Co., Los Angeles. (233C)*

Can-Making Machinery

Covers strip feed presses, curlers, and stackers for stamping and forming can ends. Each unit is pictured and detailed. *Catalog 36B, section 2, 8p.— E. W. Bliss Co., New York City. (233D)*

Piping Engineering

Technical manual presents facts on expansion and flexibility in single-plane piping systems. Booklet is one of ten covering entire field of pipe engineering. Detailed charts and calculations. *Bulletin 4.04, 20p.—National Cylinder Gas Co., Tube Turns Div., Louisville, Ky. (233E)*

Automatic Speed Controls

Concerns various electrical and pneumatic means for automatic regulation of variable speed controllers. Diagrams illustrate hookups. *Bulletin C-100, 4p.— Graham Transmissions Inc., Menomee Falls, Wis. (233F)*

Separators, Vibrators

Pictures and gives brief facts on a series of magnetic separators and vibratory feeding devices. Units include magnetic pulleys, drums, plates, and rolls. Bin vibrators and feeders also included. *Bulletin B 90-1, 2p.—Eriez Mfg. Co., Erie, Pa. (233G)*

Tube & Pipe Analysis

Chart gives breakdown on analyses, applications, properties, and strength tests for a series of 15 alloy tubings used in high temperature applications. *Technical Data Card, 163A, 6p.—Babcock & Wilcox Co., Beaver Falls, Pa. (233H)*

Armor Plating for Floors

Describes application of square steel plates on floors that give rugged protection in heavy traffic areas. Photos show how to install. *4p.—Acme Steel Co., Chicago. (233I)*

Strong Paneling

Considers installation and advantages of an asbestos-and-cement sheeting material for paneling cooling towers, cold storage rooms, and other places where weather or temperature conditions are severe. 6p.—*Johns-Manville, New York City. (233J)*

Centrifugal Pumps

Details complete line of cradle-mounted, end-suction, centrifugal pumps with capacities ranging from 5 to 2,800 gpm. Cross section views point up design features. Tables give performance ratings. *Form 7223-B. 20p.— Ingersoll-Rand Co., New York City. (233K)*

Valve Operators

Specifies construction features of a spring-and-diaphragm device for operating butterfly and burner valves, and dampers. Table lists operating characteristics. *Bulletin B-1020-5, 4p.—Conoflow Corp., Philadelphia. (233L)*

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Hydraulic Pumps

Concerns design advantages of a line of solenoid-actuated hydraulic pumps for fluid power transmission. Complete control circuits are charted and specs tabled. *Bulletin 44200-A 12p.— Oilgear Co., Milwaukee. (233M)*

Refrigeration Insulation

Considers insulating properties, fire resistance, structural strength, and other properties of an insulation for refrigerated storage spaces that is formed of a min-

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eral wool, held together with asphaltic binder. *4p—Johns-Manville, New York City. (233N)*

Flexible Shafting

Treats of applications, and details selection data for a series of flexible power-transmission shafts. Photos show typical installations. *12p.—Stow Mfg. Co., Binghamton, N. Y. (234A)*

Motor Line

Full-color bulletin briefs data on a wide line of standard, fully-enclosed, explosion-proof, gear head, variable speed, and vertical motors. Cutaways illustrate design. *8p.—U. S. Electrical Motors, Inc., Los Angeles. (234B)*

Steel Grating

Informs on structure and usefulness of an expanded-metal steel grating for floors, platforms, stairs, and other applications. Examples and installation are discussed. *12p.—Globe Co., Grip-Strut Div., Chicago. (234C)*

Sewage Treating Unit

Reports action of a coagulating tank in removing high suspended solids from water supplies or sewage. Line drawings portray equipment and how it works. *Bulletin 6801-R, 12p.—Dorr-Oliver, Inc., Stamford, Conn. (234C1)*

Standard Centrifugals

Presents cross-sections, parts lists, capacity charts, and sizes for a series of standard, end-suction centrifugal pumps with capacities up to 7,000 gpm. *Circular 184, 12p.—Dean Bros. Pumps, Inc., Indianapolis. (234D)*

Hydraulic Control Valves

Comprises full facts on a line of two-way control valves for hydraulic systems. Units stand pressures to 3,000 psi., some even to 5,000 psi. Drawings and charts make selection easy. *Bulletin 80200, 8p.—Oilgear Co., Milwaukee. (234E)*

Solenoid Valves

Gives comprehensive details on wide line of standard and special 2-, 3-, and 4-way solenoid valves. Prices and specs are tabulated, flow rates graphed. *Condensed catalog, 201, 34p.—Automatic Switch Co., Orange, N. J. (234F)*

Forged Steel Valves

Concerns construction of a series of forged steel angle, globe, needle, check, and flow-control valves and strainers. Exploded views and cutaway drawings show pertinent parts. *Catalog 700, 16p. —Velan Engineering Ltd., Montreal, Que. (234G)*

Twin-Belt Reducer

Considers wide range of flexibility available with a two-belt variable speed drive. Pertinent engineering facts are detailed, tables speed selection. *Bulletin 1600-B7, 16p. — Worthington Corp., Harrison, N. J. (234H)*

Plastic-Lined Piping

Presents a complete line of Saran-lined, steel and iron pipe, fittings, and valves for use where high mechanical strength and corrosion resistance are a must. All units are pictured and accompanied by selection charts. *32p. —Dow Chemical Co., Saran Fabrication Div., Bay City, Mich. (234I)*

Shock Control Theory

Gives basic theory of vibration isolation and shock absorption, and formulas and graphs to aid in calculating such vibration in machinery. *Bulletin SVC-55, 4p.— T. R. Finn & Co., Inc., Hawthorne, N. J. (234J)*

Cold Storage Doors

Large picture booklet covers manufacturing of a line of cold storage doors. Many photos show typical installations in food plants. *28p.—Jamison Cold Storage Door Co., Hagerstown, Md. (234K)*

Lubrication Systems

Specifies reservoirs, tubing, fittings, junctions, and metering units that comprise various automatic lubrication systems for large machines. Drawings and schematics show operation. *Bulletin 4A, 12p.—Bijur Lubricating Corp., Rochelle Park, N. J. (234L)*

Power Transmissions

Comprises a comprehensive engineering catalog, covering a wide line of power transmission machinery. Pictures, diagrams, tables, and cutaways describe and price clutches, couplings, pulleys, speed reducers, V-belt drives, and many other units. *Catalog D656, 328p.—Dodge Mfg. Corp., Mishawaka, Ind. (234M)*

DC Motors, Generators

Informs on a series of direct current motors, rated from ½ to 200 hp., and motor-generator sets with outputs to 200 kw. Describes shunt and stablized-shunt-wound, compound wound, and series wound motors in eight different frames. *Bulletin 53B8424, 6p.— Allis-Chalmers Mfg. Co., Milwaukee, Wis. (234N)*

Dry-Type Air Filter

Step-by-step pictures show installation and removal of spun-glass pads in a dry-type air filter. The seven-pocket unit is rated at 1,000 cfm. *Bulletin 237, 8p.— American Air Filter Co., Inc., Louisville, Ky. (234O)*

Automatic Shutoff

Cross-section drawings illustrate constructon and operaton of a series of automatic shutoff valves to control excess flow or over-temperature. Spring-loaded dia-

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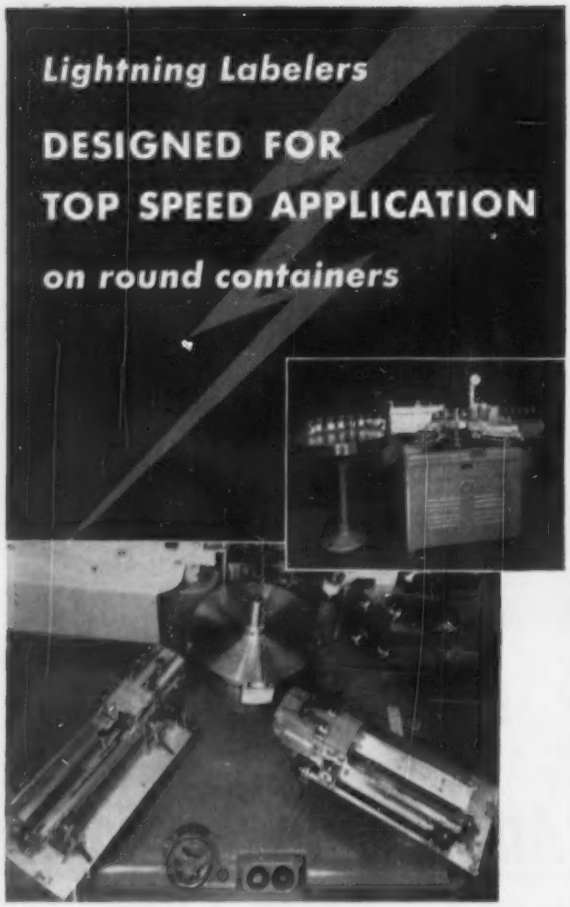

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phragm and piston-type units are available in 1½ to 8 in. sizes, in bronze and stainless steel. Pressure ratings to 1,500 psi. *Bulletin 500, 4p.—Coppus Engineering Corp., Worcester, Mass. (234P)*

Plastic Tubing

Concerns physical characteristics and numerous applications for a line of plastic tubing. Many food applications cited. Table specifics tubing for wide line of food products. *Bulletin T-97, 28p.—U. S. Stoneware Co., Akron, Ohio. (236A)*

Centrifugal Air Washer

Covers operation and construction features of a centrifugal-type air washer, available with capacities from 900 to 32,000 cfm. Horsepower ratings range from 3 to 100 hp. *Bulletin W-7456, 4p.—Ducon Co., Mineola, N. Y. (236B)*

Automatic Clutches

Briefs data on a series of automatic clutches for use on gas engines and electric motors from ½ to 25 hp. Custom-built designs also noted. *Bulletin 56-D-1, 4p.—Salisbury Corp., Los Angeles (236C)*

Nickel-Lined Piping

Treats of seamless steel piping and fittings, coated inside with pure nickel for high corrosion resistance. Welding procedures and general fabrication techniques also discussed. Applications in food industry are noted. *8p.—Bart Mfg. Corp., Belleville, N. J. (236D)*

Speed Reducers

Tables full selection data for a comprehensive line of single-, double-, and triple-reduction speed reducers, rated from 1 to 4,000 hp. Pictures and drawings show units and their components. *Booklet B-6727, 46p.—Westinghouse Electric Corp., Pittsburgh, Pa. (236E)*

Prefabricated Stack

Shows method of installing a boiler stack, preformed in 3-ft sections from vermiculite and cement. Various stainless steel and aluminum panels increase its life and corrosion resistance. *Folder IF-28, 4p.—Van Packard Corp., Bettendorf, Iowa. (236F)*

Pressure Reducing Valves

Installation adjustment, operation, and servicing discussed for a group of spring-loaded, piston-operated pressure reducing valves. Self-contained units are designed for inlet pressures to 1,500 psi. at 875F. It will reduce pressures to as low as ½ psi. in one stage. *6p.—Atlas Valve Co., Newark, N. J. (236G)*

MATERIALS HANDLING

Special Conveyors

Tells about a magnetic elevator, a tubular material-handling unit, and a piano-hinged steel belt conveyor and elevator. Also brief facts on special custom-built units. *Catalog 500, 48p.—Prab Conveyors, Inc., Roseville, Mich. (236H)*

Powered Conveyor Turns

Portrays construction and operation of a powered conveyor turn, available in 90 and 180 deg. models. Special units can be had in other angles. Device features a mesh belt that runs on nylon wearing rails. *2p.—Voss Belting & Specialty Co., Chicago. (236I)*

Fork Lift Batteries

Full details on battery construction and complete engineering specifications are available on three new fork truck batteries, rated at 40-, 60,- and 120-amp. hr. *Bulletin GB1668-B, 8p.—Gould-National Batteries, Inc., Trenton, N. J. (236J)*

Multi-Rail Conveyor

Relates facts on an unusual, skate wheel conveyor system that consists of several separate rails. These components can be combined in many different ways to form portable or fixed conveying systems. Pictures show numerous installations. *Catalog LR-56, 6p.—Alvey-Ferguson Co., Cincinnati. (236K)*

Hand Truck

Shows construction of a four-model line of material-carrying hand trucks available with 10- and 6-in. wheels. *1p.—Nutting Truck & Caster Co., Faribault, Minn. (236L)*

Gas-Electric Fork Truck

Specifies unusual features of a new 4,000-lb.-capacity fork lift truck that is powered by both gasoline and electricity. Gas engine drives generator, which in turn, powers the electric drive motor. *Bulletin 6008A, 4p.—Automatic Transportation Co., Chicago. (236M)*

Low-Profile Trucks

Contains specifications and drawings of a low-built, electric-drive fork-lift truck built for operation in areas with low overhead clearances. Telescopic lift rises 102 in. Capacity: 2,000 lb. Bulletin 6011A, 4p.—*Automatic Transportation Co., Chicago. (236N)*

Stock Boxes

Presents a series of molded, glass fiber, stock boxes—with or without lids—that provide sanitary storage and carrying for many types of food ingredients. 3p.—

Molded Fiberglass Tray Co., Linesville, Pa. (236O)

Telescopic Conveyors

Shows many applications and advantages for a 3- and 4-stage telescopic roller conveyor with accessory curves. Also depicts a powered telescopic belt conveyor in 3-, and 4-extension models. Units hike truck-loading speed. *Catalog 102, 24p.—Wilkie Co., Philadelphia. (237A)*

MAINTENANCE

Circulating Oils

Technical discussion covers application of a continuous lubrication system to steam turbines and other heavy machines. Lubricants used are termed "circulating oils" and their properties are fully discussed. *Lubrication, No. 9, 15p.—The Texas Co., New York City. (237B)*

Constant-Level Oilers

Pictures and details advantages for a series of oil cups that maintain a constant level of oil in the bearing reservoir. Units operate on liquid-seal principle. Transparent reservoirs permit visual check of oil supply at all times. *Catalog 10, 2p.—Oil-rite Corp., Manitowoc, Wis. (237D)*

Wire Rope Assemblies

Features galvanized steel, stainless steel, and bright-steel wire ropes—equipped with eyes, ring eyes, forks, sleeves, studs, and other terminals. Table gives full specifications. *Catalog 5601, 24p.—MacWhyte Co., Kenosha, Wis. (237C)*

Protective Coatings

Details three general types of corrosion-proof coatings for applications in general corrosion control, heavy-duty service, and lining of steel drums and tanks. *Bulletin CATEM C-2, 4p.—Metal & Thermit Corp. Rahway, N. J. (237E)*

INGREDIENTS

Niacin News

Bulletin announces entry of this company into production and marketing of Niacin. Also, it tells general applications of niacin in human, plant, and animal nutrition. *Bulletin T-102-56, 4p.—Koppers Co., Inc., Tar Products Div., Pittsburgh. (237F)*

Useful Flavor Chart

Lists wide variety of food flavors in chart form with recommended uses. Products range from soft drink powders to bakery products and candy and milk drinks. Amounts of flavor are keyed to product weights.—*Van Ameringen-Haebler, Inc., N.Y.C. (237G)*

PROCESSING

Stainless Steel Units

Considers applications of stainless steel in a wide variety of food processing machines. Numerous pictures illustrate. *12p.—Republic Steel Corp., Massillon, Ohio. (237H)*

Multi-Tube Filters

Cutaways and graphs show action of two types of tube filters. Units are constructed with porous stone, porous screen, or wedge-wire tubes for differing filter applications. Compressed air aids backwashing. *Bulletin 909, 10p.—R. P. Adams Co., Inc., Buffalo. (237I)*

Hammermill Feeder

Pictures a rotating feed device, said to eliminate overload and the danger of burned out motors on hammermills. Unit is easy to install and adaptable to any make, model, or speed of hammermill. *2p.—G. W. Reaves Milling Machinery, Inc., Chattanooga, Tenn. (237J)*

How to Apply Antifoams

Contains several methods for adding specialized anti-foam agents in both batch and continuous processes. Methods range from a simple hand operation to complex automatic feeding systems. *4p.—Hodag Chemical Corp., Chicago. (237K)*

Ribbon Mixers

Concerns eight different sizes of ribbon-type mixers, available with any of six different agitators. Units range in capacity from 25 to 450 gal. *Bulletin 300, 2p.—Cincinnati Hildebrand Co., Inc., Cincinnati. (237L)*

Centrifuge Line

Comprehensive cutaway drawings show construction and action of heavy-duty and standard, nozzle centrifuges for liquid and solids separation. Described units handle loads requiring 20 to 50 hp. *Bulletin 1279, 12p.—Sharples Corp., Philadelphia. (237M)*

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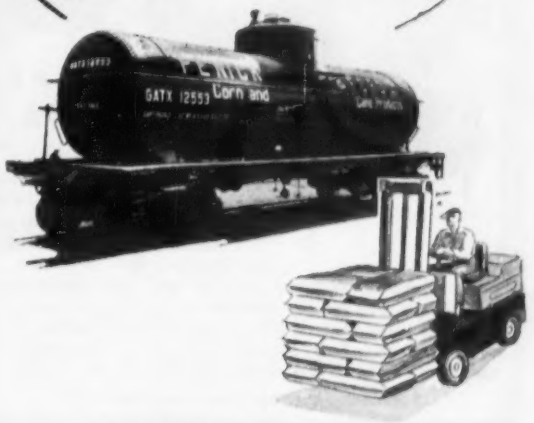

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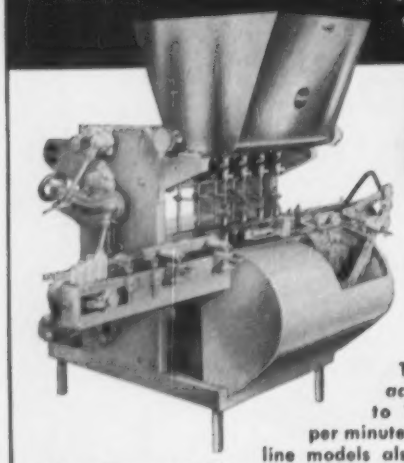

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Tank-Mounted Mixers

Leaflet describes features of swivel-joint tank mixers, available from ¼ hp. Standard shaft lengths range to 48 in., but special sizes are available. *Bulletin EL-2, 2p. —Ertel Engineering Corp., Kingston, N. Y. (238A)*

Curd Concentrator

Pictures and specifies specialized operation of a centrifugal curd separator, used in cheese processing. Unit has input capacity of 900 gal. per hr. *8p.—DeLaval Separator Co., Poughkeepsie, N. Y. (238B)*

QUALITY CONTROL

Vapor Chromatography

Bulletin considers equipment and techniques for analyzing compounds by means of vapor phase chromatography. Typical charts and specifications are detailed. *16p.—Perkin-Elmer Corp., Norwalk, Conn. (238C)*

Photo-Electric Colorimeter

Presents a compact laboratory instrument suitable for all colorimetric measurements including the measuring of turbidity in fluorescent and photo-electric titration. Diagram illustrates operation. Unit can be adapted for micro techniques. *6p.—Eppig, Inc., New York City (238D)*

pH Control of Waste

Discusses various waste treatment processes and notes prominence of pH control. Details various methods for overcoming difficult control problems in this area. *10p.—Beckman Instruments, Inc., Fullerton, Calif. (238E)*

Portable Viscometer

Pictures and details operations of a compact, portable viscometer. Unit is easy to clean, accurate, and speedy. *8p.—Brookfield Engineering Laboratories, Inc., Stoughton, Mass. (238F)*

Lab Hydrometers

Specifies a full line of hydrometers, thermo-hydrometers, and hydrometer jars. Units are designed for measurement of a wide variety of liquids from alcohol to sugar solutions. *Bulletin G-3, 8p.—Precision Thermometer & Instrument Co., Philadelphia. (238G)*

Fast-Acting Scale

Gives full data on a self-balancing 5,000-g.-capacity scale that reads directly to one gram. Device gives readings in both metric and avoirdupois units. *1p.—Arthur F. LaPine & Co., Chicago. (238H)*

Testing Service

Large bulletin covers chemical, electrical, electronic, mechanical, physical, photometric, radiometric and colorimetric testing facilities available to industry through this independent testing laboratory. *72p.—Electrical Testing Laboratories, Inc., New York City. (238I)*

INSTRUMENTS

Bayonet Thermocouples

Concerns applications of a series of miniature, bayonet-type thermocouples for measuring temperatures of engine and pump cylinder heads, electric motors, and other heat-generating equipment. Various adaptors, clamps and couplings are specified. *Bulletin 2, 10p.—Thermo Electric Co., Inc., Saddle Brook, N. J. (238J)*

Steam Plant Instruments

Company publication gives comprehensive details on instrumentation and combustion control for small steam plants. Photos show typical set-ups on installations ranging from 3,000 to 20,000 lb. steam per hr. *Energy, Form 3547, 24p.—Energy Control Co., Inc., New York City. (238K)*

Liquid Batch Control

Schematic diagrams inform on automatic ways to add predetermined fluid volumes to batch processes. Systems comprise a predetermining counter and integrating flowmeter. *Catalog 91-109, 4p.—Fischer & Porter Co., Hatboro, Pa. (238L)*

Delayed Control

Diagrams operation of a magnetic and photoelectric device for elapsed time control of processing and conveyorizing operations. Unit detects and classifies a signal, then responds with controlling action at a later time. *6p.—Automation, Inc., Wellesley Hills, Mass. (238M)*

Calibration for Dials

Specifies a variety of available dials for liquidometer and levelometer tank gages. Actual layouts show dial divisions, and maximum and minimum readings. *Bulletin DX47, 6p.—Liquidometer Corp., Long Island City, New York. (238N)*

Flow Transmitter

Depicts cutaway views and schematic representation of mercury,

U-tube and bellows-type transmitters for indicating, recording, and integrating liquid and gas flow-rates. *Specification Sheet T22-6, 4p.—Bailey Meter Co., Cleveland. (238O)*

Tilting Thermometers

Concerns features and specifications for a series of tilting-head thermometers with screw-type sockets, available in ranges from —80 to 1,000F. *Bulletin 148, 4p.—Manning, Maxwell & Moore, Stratford, Conn. (239A)*

Self-Acting Regulators

Details action and specifications for a series of self-operating, temperature-regulating valves for steam, water, gases, and other non-corrosive fluids. Pictures show models, cutaway reveals construction. *Bulletin 500, 4p.—A. W. Cash Co., Decatur, Ill. (239B)*

Smokehouse Controls

Pictures and details thermocouple, wiring, and indicating and recording systems for remote observation of smokehouse temperatures. Device is said to handle as many as twenty smokehouses or cookers at a time. *Data Sheet 3.7–9, 2p. — Minneapolis-Honeywell Regulator Co., Philadelphia. (239C)*

Remote-Reading Gages

Considers advantages of a newly developed, remote-reading liquid level gage, with built-in red-light flasher for positive warning on high and low liquid levels. For boiler operation, units available in four pressure groups from under 900 psi. to over 1,500 psi. *Bulletin 291, 8p.—Jerguson Gage & Valve Co., Somerville, Mass. (239D)*

Automatic Interval Timer

Compact instrument, designed for panel mounting, gives automatic shutoff and instantaneous reset for pushbutton timing control. Twelve time-ranges are available from 6 sec. to 24 hr. *2p.—Cramer Control Corp., Centerbrook, Conn. (239E)*

Bin Level Indicator

Detailed drawings show operation of a high-and-low level controller for storage bins and silos. Unit operates on a rotating paddle principle. *Bulletin 1-5A, 4p.—Fuller Co., Catasauqua, Pa. (239F)*

Combustion Control

First of a series of publications considers safety, efficiency, and equipment life as they apply to combustion control instruments. A dictionary of control terminology is included. *16p.—Cleveland Fuel Equipment Co., Cleveland. (239G)*

General Instruments

Briefly describes and specifies over 100 measuring, transmitting, receiving, recording, and indicating instruments and control components for both power and process applications. Pictures show the various devices. *Bulletin G15-1, 8p.—Bailey Meter Co., Cleveland. (239H)*

Compact Panel Controls

Relates facts on a wide line of instruments for measuring electricity. Devices for measuring both ac and dc currents and voltages are listed. *28p.—Weston Electrical Instrument Corp., Newark, N. J. (239I)*

Data Processing

Outlines an electronic device for monitoring, recording, and processing data from various process variables. Control information is presented in log sheet and punched card form. Various pictures illustrate set-up. *14p.—Beckman Instruments, Inc., Fullerton, Calif. (239J)*

Electronic Weighing

Treats of a compact electronic unit that installs under a conveyor belt to give continuous measurement of product flow. Unit can also be used to control flow rate and proportion ingredients. *6p. —Bell Automation Corp., Rochester N. Y. (239K)*

Combustion Meters

Shows photos and operational diagrams for different types of chemically-operated CO_2 analyzers and recorders. Applications, principles, features, and models are covered. Publication 56-553-1, 4p.—Hays Corp., Michigan City, Ind. *(239L)*

TRANSPORTATION

Wide Truck Line

Full color catalog gives complete information on four-wheel conventional and cab-over-engine heavy-duty trucks. Gasoline, LPG, and diesel-powered models are covered. Photos and cutaway drawings show motor and chassis features. *Catalog CR-674-F, 20p. —International Harvester Co., Chicago. (239M)*

Dry-Ice Bunkers

Pictures and briefs information on a series of blower-type dry-ice bunkers for truck chilling. *2p.—Amerio Refrigerating Equip. Co., Inc., Union City, N. J. (239N)*

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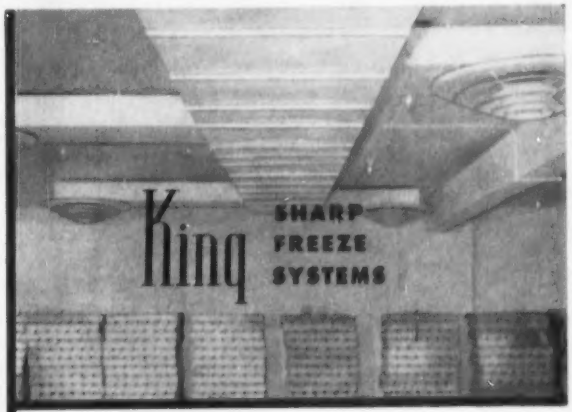

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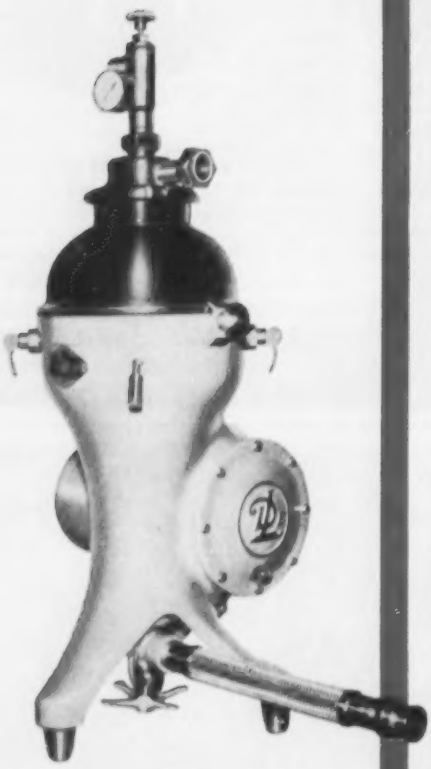

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CARROT OIL makes food golden yellow

Carrot oil, like butter, contains carotene. Carrot oil is extracted from carrots, and each pound contains up to 25 million units of carotene, the international standard of vitamin A.

Carrott oil is preferred for vitaminizing foods because it is a natural vegetable oil and because it contributes vitamin A of high stability and desirable golden yellow color. Carrot oil is not synthetic, does not contain animal fats of any kind, and does not produce fishy flavor.

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New 36-page combined catalog on carrot oil for foods, feeds, and pharmaceuticals. Important reading for most food processors. Write today!

NUTRITIONAL RESEARCH ASSOCIATES
205 Broad St., South Whitley, Ind.

QUAKER CITY COLD STORAGE CO., INC.
PHILADELPHIA, PA.
3 WAREHOUSE LOCATIONS
Proper Temperature for Frozen Foods

the advertisements on the following pages

are live opportunities in the field of food processing and distribution.

Each announcement represents a current Want or Offering of an organization or individual in the field, with some element of profit in each for whoever can fill the need. Some have money-saving possibilities, others are opportunities for more business; many are employment opportunities; still others offer property, or equipment—used or surplus new equipment.

"Searchlight" advertisements are constantly changing. New opportunities are constantly finding their way into this great Want medium, each issue. Regular reading of the "Searchlight" pages can be as important to you as reading the editorial sections; Editorial matter is NEWS OF OPPORTUNITIES offered in the industry.

for EVERY business WANT
"Think SEARCHLIGHT first"

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The Advertisements in this section include all employment opportunities—executive, management, technical, selling, office, skilled, manual, etc.

Positions Vacant
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Positions Wanted—The rate is one-half of the above, payable in advance.

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December Issue closes November 28th.

INDUSTRIAL ENGINEER

Exceptional opportunity for individual expression, recognition, and advancement with an internationally recognized leader in the food industry.

Graduate I.E. or M.E. to relocate near Syracuse, New York. A minimum of 1 year plant experience desired, food or chemical process preferred. Duties will include Methods Analysis, Standard Costs and Budgets, Development and Administration of Wage Incentive Plans, and some use of Time Study Techniques. Age to 35.

We will pay a high salary commensurate with the qualifications and experience of the man who we feel can take on the responsibilities of this assignment. Complete range of generous employee benefits.

Please write full details to:

P-3340, Food Engineering
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

"WE NEED A QUEER MAN!

No, not really queer, but an unusual man for an unusually challenging opportunity.

We are building a new branch bakery which will include the manufacture of at least two or three other semi-related food lines.

We need a man to head this operation who can both work and dream with enthusiasm. He may or may not now be in the Bakery field, he will be well educated, of mature business age and able to build an efficient and loyal organization. Probably he is now in some phase of the food industry.

Compensation? Ample in dollars—unlimited in terms of possible accomplishment.

Full details, your picture and all other pertinent data in your first letter, please. "All replies treated confidentially."

P-3195, Food Engineering.
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

PRODUCTION MANAGER

At least five (5) years experience in vegetable processing and canning. Location New York Metropolitan area. Write, stating age, experience, reference and salary expected. Replies will be held in confidence. Advertiser's employees are aware of this advertisement.

P-3201, Food Engineering
Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

ENGINEER

INDUSTRIAL or MECHANICAL

Permanent position with national concern for industrial or mechanical staff engineer to assist and advise the management of several food plants and feed mills. Experience in food or feed industry desirable. Location—Middle West. Please furnish complete resume of qualifications and initial salary requirements. Replies held in confidence.

P-3291, Food Engineering
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

REPLIES (Box No.): Address to office nearest you
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NEW YORK: P. O. Box 12 (36)
CHICAGO: 520 N. Michigan Ave. (11)
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POSITION VACANT

Mechanical or Chemical Engineer. Outstanding opportunity with long established midwestern company for graduate engineer with experience in selection, layout and installation of food processing, packaging or chemical equipment. Mature young man desired who is capable of handling all phases of projects including estimating, design and field followup. Assignments in maintenance engineering also included in work. Salary commensurate with experience, liberal benefit program included. Send complete resume and salary requirement to box P-3377, Food Engineering.

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Manufacturer's Representative,
Chemist, well established,

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RA-1336, Food Engineering
520 N. Michigan Ave., Chicago 11, Ill.

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For the young management-minded engineer there are unusual opportunities with one of America's leading food processors in the following fields:

Packaging
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Prefer men under 35 with professional training in field of specialization. Minimum of one year's experience in processing type industry. Send detailed resume indicating education, experience, salary expectation, and location flexibility to:

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FOOD TECHNOLOGISTS and
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Call, write or wire:
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FOOD ENGINEERING
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Good condition, appreciate prompt reply

BONDED EDIBLE OIL

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I. E. NEWMAN

818 W. Superior, Chicago, Ill.

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Of Food Engineering published monthly at Albany, New York for October 1, 1956.

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By JOHN J. COOKE, Secretary.

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[SEAL] JANET A. HARTWICK.
(My Commission expires March 30, 1957)

If there is
Anything you want . . .
that other readers of this paper can supply
Or—
Something you don't want
that other readers can use, advertise it in the
SEARCHLIGHT SECTION

LOEB OFFERINGS

- Cappers Capem, Titecap, Swanson, U. S. automatic and semi-automatic
- Centrifugals: Fletcher 12" copper, 20" lith-coated, Tolhurst 26" copper, 26" rubber
- Clarifiers: De Laval model 84-51.
- Compressor, Freon: Carrier 25/12½ hp.
- Cutter, Bone: Wausau, 5 hp.
- Cutters, silent: Buffalo 32" and 43".
- Demineralizer: Barnstead 80 GPH.
- Dryer: Devine 2 x 4' vac. drum, st. steel.
- Dryer: Devine #1 vacuum 5 shelves.
- Dryer: Bowen lab. spray, st. steel.
- Dryer: Direct Heat 4' x 20'.
- Dryer: Stokes rotary vacuum 2½ x 8'.
- Extractor: Troy 26" monel basket.
- Fillers, liquid: Peerless 6 valve, Cass gross weight, siphon and vac. types.
- Fillers, piston: Stokes, Colton, Elgin, Filler Machine Co. for jars, tubes.
- Fillers, powder: Speedee, Triangle, Stokes & Smith, Ferguson, Gump.
- Filter Presses: Sperry, Shriver 6"-36", recessed and plate and frames types.
- Filters: Int. pressure—Alsop, Sparkler, Lomax, Industrial, Sweetland.
- Filter, vacuum: Oliver 2½ x 1'.
- Homogenizer: 2-1200 GHP. Union, 300 GHP. Union, 125 and 400 GPH. Gaulin.
- Kettle: Dopp 150 gal., jkt., agitated.
- Kettles, Stainless steel 5 to 300 gal., with and without agitators, aluminum 40 to 100 gal.
- Labelers: Burt, Knapp, New Jersey, World, Ermold—auto and semi-auto.
- Mills, hammer: Mikro, 2DH, 2TH, Gump #1, Prater, Raymond, Jay Bee, Jeffrey 30 x 24", Williams #2 and 8X.
- Colloid: Charlotte st. steel 1 hp., Iron 25 hp.
- Mixers: Dough type single and double arm, 5 to 100 gal.
- Powder: 50 to 2000 lb. capacity. Portable Electric: ¼ to 5 hp.
- Pasteurizer: Wallace-Walker plate type, 200 GPH, st. steel.
- Pumps: Centrifugal, rotary, gear, vacuum, all types and sizes.
- Screens: Rotex 20 x 48", 42 x 84', 18 x 50", Selectro 4 x 10' Abbe Blutergess #1.
- Separator: De Laval Nozzle-Matic AC VO.
- Sealers, carton: Ceco, Triangle, Packomatic.
- Sterilizers: Climax 20" x 36" jacketed.
- Still, water: Barnstead 75 gal.
- Tablet Presses: Single punch and rotary.
- Tanks: Glass lined, various sizes. Stain. steel 25 gal. to 1200 gal. 3—6000 gal. insulated, agitated.

Send us your inquiries and list of idle equipment

LOEB EQUIPMENT SUPPLY CO.

820 West Superior St. — **Chicago 22, Ill.**
Telephone Seeley 8-1431 — **Our 32nd Year**

EXTRA SPECIAL

PFAUDLER PISTON FILLER

- **Model R.P. 14**
- **All Stainless contact**
- **New 1953**
- **Excellent Condition.**

MACHINERY AND EQUIPMENT CO.

514 Bryant Street
San Francisco, Calif.

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MRM 12 spt. SS Straight Line Vac. Filler
Biner Ellison Model 16-Q Filamatic
2 Pony Labelers 86MXX and 86ML
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Capem SIF Auto. Capper, up to 88 min.
Mikro Pulverizers #1-2-3 & 4
Resina Cappers, single & twin heads
World Twin Turret Labeler, 120 per min.
Elgin Piston, Fillers, SS, 1 & 2 spouts
2 Day 60 cu. ft. Powder Blenders
MRM 12 spt. SS Rotary Vacuum Filler
Wrap Around Labelers, All Makes & Sizes

NEW—STEEL & S/S MIXERS, KETTLES, TANKS & DRYERS. Fabricated to Your Specifications. Engineers Advice Available.

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YOU CAN BANK ON

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Complete stock from 10-2,000 h.p. Nation's largest inventory, New & Used

WABASH POWER EQUIPMENT
31 E. CONGRESS, CHICAGO 5, HA 7-4855

FOR SALE

Bucket Elevators, Screw Conveyors, Tyler Hummer Screen, 1000 #3ph. Trolley Hoist

T. M. N.
67 Van Reipen Ave. — **Jersey City, N. J.**
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FOR SALE

30" Copper Coating Pans with steam coils
300 gal. Copper Still with condenser and tank
100 qt. 3 speed Read Master Mixer
80 qt. M-80 4-speed Hobart Mixer
100 gal. Copper Steam Jacketed Mixing Kettle
York Freon Compressor with 1½ HP 3 phase motor
Burns Split Nut Peanut Blancher

SAVAGE BROS. CO.
2836 Gladys Ave. — **Chicago 12, Ill.**

FMC

INVENTORY TIME COMING
RE-APPRAISE
YOUR EQUIPMENT
TRADE OR SELL US
YOUR IDLE UNITS!

WE BUY AND SELL MACHINERY LIKE THESE LISTED BELOW!

SEND US YOUR LIST
WE'LL SEND YOU OURS

MIXERS; NEW Falcon Ribbon Mixers in Steel or Stainless Steel, all sizes; Portable Agitators, Mixing Tanks; Heavy Duty Dough and Mass Mixers, Double Arm, Jacketed or Unjacketed. Send for complete List of Availables.

KETTLES, TANKS, VACUUM PANS, REACTORS; In Stainless, Steel, Copper, Nickel, Monel and Iron; send for complete list of our large stock.

EVAPORATORS, STILLS, COLUMNS by Buffalo, Swenson, Blaw Knox, Zaremba and others in all wanted metals.

COLLOID MILLS; Homogenizers, Viscolizers; send for complete list.

DRYERS; send for complete list.

FILLERS; for Liquids, Semi-Liquids, Pastes, Powders, Crystals, etc. Karl Kiefer, Stokes & Smith, Triangle, Food Machinery Co., Filler Machinery Co. and other standard makes for all filling purposes; Semi and Fully Aut.

FILTERS; All types including Filter Presses, Disc Filters, Pressure Filters, send for complete list.

LABELERS; Semi and Fully Automatic Units by World, Ermold, New Jersey, Pneumatic Scale, and others; Please submit labeling problem for exact recommendations.

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Brewery — Distillery — Winery — Macaroni — Spaghetti — Ravioli — Vegetable Processing — Canning — Dog-Cat Food; Meat Packing; Vegetable Oil Extraction; Pectin Extraction, etc.

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FRED R. FRISTENBERG, *Pres.*

FIRST MACHINERY CORP.
209-289 TENTH ST.
BROOKLYN 15, N. Y.
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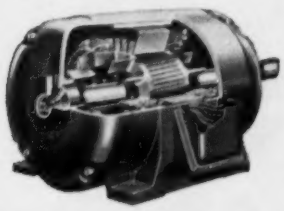

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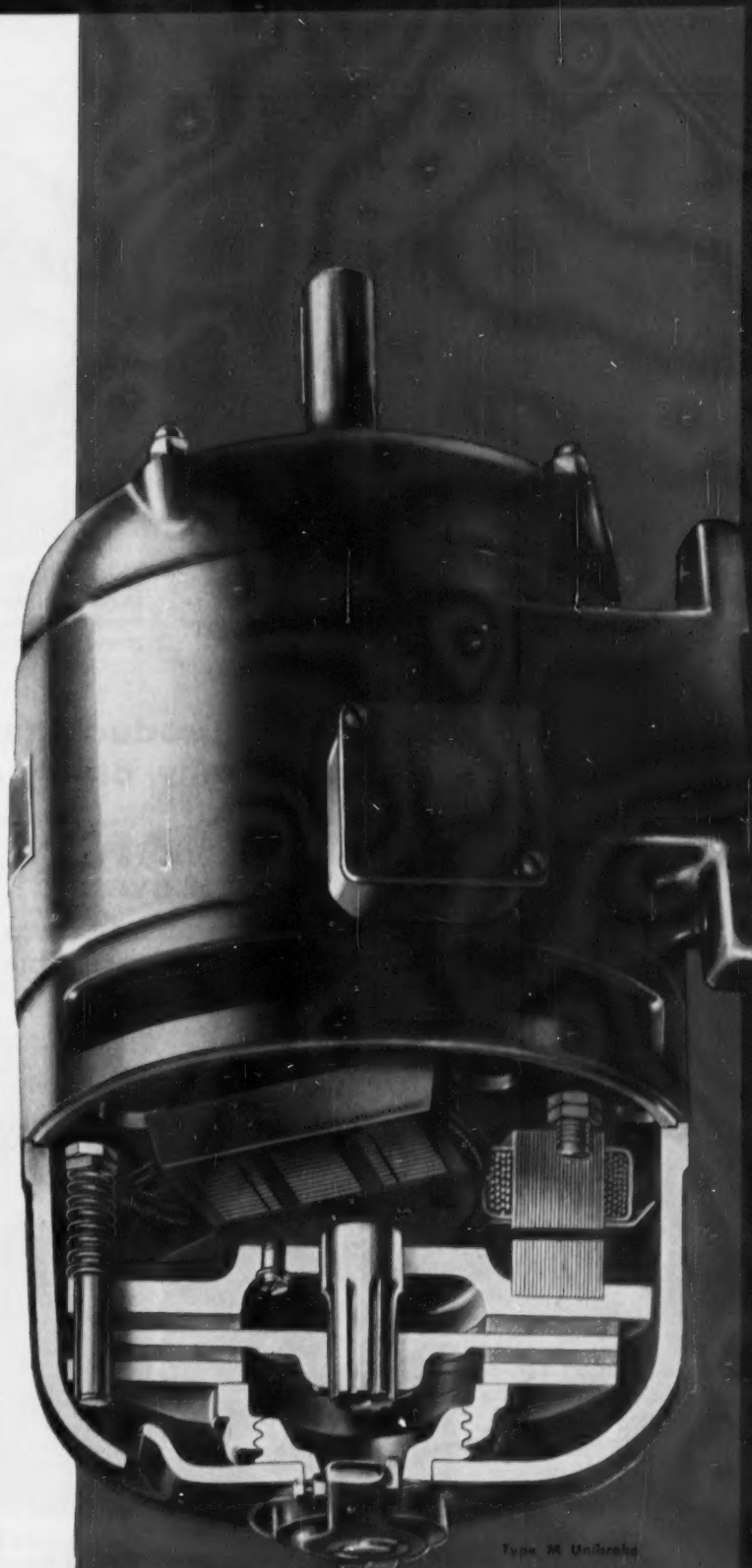

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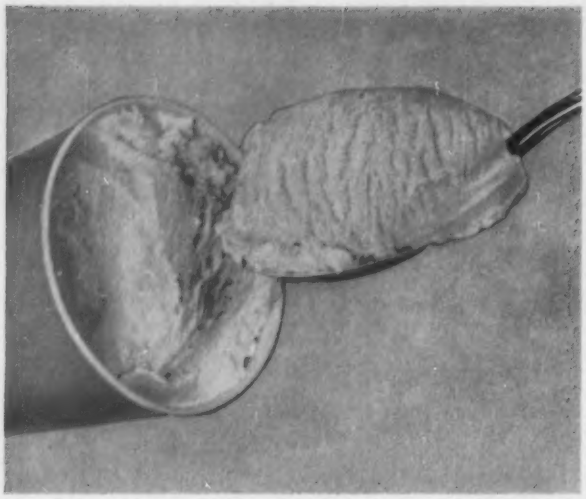

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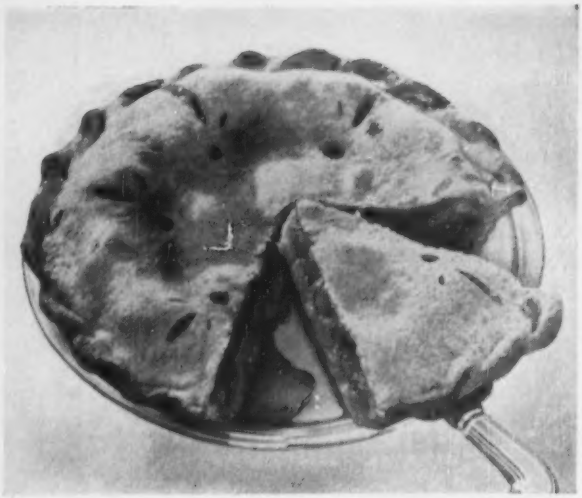

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- 30-1b Enduro drums
- 30-1c Electrunite piping
- 30-1d Titanium

32 All items shown
- 32a Orange oils
- 32b Lemon oils
- 32c Preservers' pectin
- 32d Low methoxyl pectin
- 32e Lemon juice

86 All items shown
- 86a Model EG-1
- 86b Model HG-84
- 86c Model BS
- 86d Stretchrap

93a 4800 imprinter

93b Tickometer

94a Campbell wrapper brochure

94b Campbell-Pak lit.

127 All items shown
- 127a Armaplex
- 127b Insucolor
- 127c LT cork
- 127d Armaflex

130a Bul. M-34

130b Chlorinators

136 All items shown
- 136a Bul. 559
- 136b Bul. 490C
- 136c Bul. 560
- 136d Bul. 471
- 136e Bul. 510
- 136f Buls. 529 & 549
- 136g Pneumatic conveying

143a Lubriplate bk.

143b In-line reducers

158a HVP

158b MSG

163 All items shown
- 163a SeaKem stabilizers
- 163b Colloids Out of Sea
- 163c S-K EXTRACTS
- 163d Bul. 122
- 163e Irish moss
- 163f Chiffon starting formula
- 163g SeaKem type 202
- 163h Quick-Pudd pudding
- 163i Boiled cream filling

182a S ways bklt.

182b Conveyor belt man.

186a Cat. MS-1155

186b Cat. TP-1255

186c Cat. TG-953

187a Acid & salt in pickle brine

187b Salt info.

188 All items shown
- 188a Pressure reducing valve
- 188b Type 17000-B
- 188c Type 123
- 188d Self operating temp. reg.
- 188e Type 57
- 188f Type 30
- 188g Type 44
- 188h Type 100

197a Hersey dryers

197b 750 rotaprinter

198a Cooper Alloy AKH #4

198b Kel-F pump liner

198c Cyclotherm generators

202a Bul. 89

202b Conveyor belting

206a Cat. E55

206b Determination test bklt.

209a Bul. 11-10

209b Supplement 55-A

209c Cat. 48

210a Refrigeration

210b Temp. recorder cat.

211 All items shown
- 211a Micronizer bul.
- 211b Food-grinding bulls
- 211c Conveyor bul.
- 211d Blending bul.
- 211e Separators bul.

213a Cat. Fe

213b Belt bklt.

214-5a Sorbitol

214-5b Emulsifiers

216a Bul. A-156

216b Steel

216c Cleaning in food ind.

235a Prest-O-Matic

235b Cat. 24

235c Barrett Ammonia

238a Hope cat.

238b Spray nozzles

239a Natural spices

239b Freeze systems cat.

247 All items shown
- 247a Type M unibrake
- 247b Type D unibrake
- 247c Gearmotors

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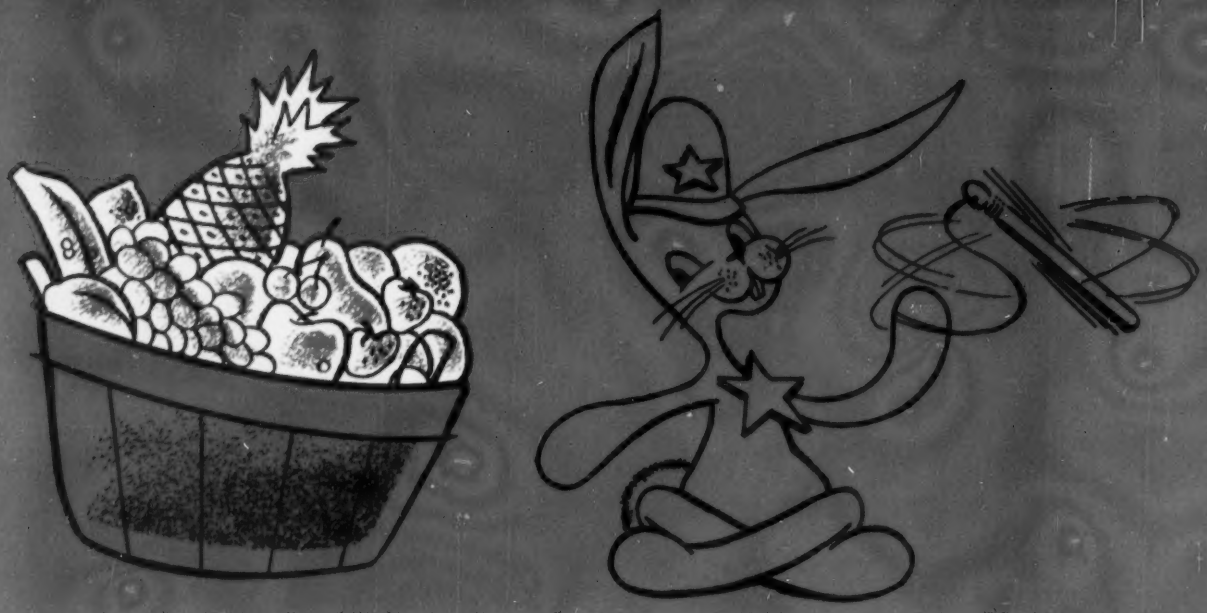

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